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THE SURGERY OF PULMONARY TUBERCULOSIS

MAIN PRINCIPLES *

BY

JOHS. GRAVESEN, M.D.COPENHAGEN

MEDICAL SUPERINTENDENT, VEJLEFJORD SANATORIUM, DENMARK

The only method which deserves consideration in this connexion is the one dealing with the continuation of artificial pneumothorax treatment. All other attempts at treating the disease surgically—for example, by drainage of cavities or lung resections—have long ago proved fruitless. On the other hand, the pneumothorax principle has proved to be so relatively effective as to encourage its use also when localized adhesions compromise the effect, or when adherent pleura prevents the establishment of an artificial pneumothorax. In these cases the pneumothorax principle can be carried out only by operative measures.

The operations can be considered in two groups: (1) operations which intend to transform an ineffective artificial pneumothorax into an effective one by removal of localized adhesions; and (2) operations which intend to replace an artificial pneumothorax which, on account of more extensive adhesions, cannot be made effective or cannot be established at all.

Theories

Before the different methods in this classification are mentioned one must explain how the pneumothorax really acts. Many theories have been in vogue during the history of artificial pneumothorax, and most of them have had to be abandoned. The mere name "collapse therapy," the term in general use, expresses an interpretation which requires thorough revision. This name would indicate that an artificially produced collapse of the lung tissue causes a better resistance of the tissue and thereby a quicker arrest of the disease.

To explain this effect different hypotheses have been formulated, such as immobilization of the organ, compression of the tissue causing local stasis of the blood- and lymph-circulation, and an increased tendency to fibrosis. Recent physiological and pathological research has shown that these supposed factors are not present at all or, if they are, that they do not exert the influence which is claimed. The more the clinician has worked with these methods the more evident it is that the effectiveness of this principle must be explained in another much simpler way.

The only theory which will withstand criticism is that of "relaxation" as the effective principle of this therapy. The aim should not be to stimulate the lung tissue to increased resistance by active compression, which cannot be done, but to leave the active factors of healing to the organism itself, and only in a more passive sense to establish conditions for the lung to exert its own spontaneous tendency for retraction. Such conditions are not present so long as the lung is kept expanded in the thorax cavity; the result is that cavities form which cannot close spontaneously. In short, this treatment has one aim: to make the closure of cavities possible by relaxing the tension of the lung. A more suitable name, therefore, would be "relaxation therapy."

The reason that this theoretical question is emphasized is that it has more than theoretical interest. The correct interpretation of the effect forms the necessary basis for the right use of the method. It is indispensable for considering the proper indications, and for deciding the principles of technique as well as for choosing among the different methods suggested.

Indications

According to the theory of relaxation the indication for operative measures only arises when there is a tendency to spontaneous retraction, and when this tendency requires improved conditions for the effective closure of the cavity or cavities. So long as the tuberculous process is in an active stage with fresh infiltration or a tendency to spread any major surgical intervention is likely to do more harm than good. The patient's immunity is already strained, and the strain added by the operation and the after-treatment may cause a serious or even fatal result.

Before a major intervention is ventured upon the disease must have reached a certain degree of demarcation. To assist the body to reach this stage conservative treatment only is indicated. It is much more important that the right phase of the disease be reached than that it should be unilateral. Unilateral disease may be quite unfit for surgical treatment, whereas bilateral disease may be fit for treatment on one or on both sides. The decision whether a case is ready for surgical intervention must be made from the indications, general and local, which show respectively a rise in the power of immunity and a demarcation of the process in the lung.

The general criteria of a phase favourable for surgery are a normal or only slightly raised temperature and stationary or increasing weight. Complications, especially in the larynx and intestines, need not be a contra-indication; but they do contraindicate so long as they are under development, thus expressing a temporary or more permanent drop in the resistance power of the patient. These general symptoms, known from old times, should not be undervalued. They are not, however, always sufficient for a reliable judgement to be made. Even when the general condition is apparently good the phase of immunity may be unsafe for more radical treatment. To the old criteria must therefore be added some of more recent discovery. The blood sedimentation rate gives comparatively clear information about the development of resistance: this

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rate, tested by serial examinations, ought to show a decreasing scale. While the rate is increasing, or keeping high, great care is advisable.

The sedimentation rate, however, is not always reliable, since it may be influenced by irrelevant factors. More reliable information is given by serial examination of the blood picture, the leucocytes being counted differentially by the Arneth or Schilling method. The " shift to the left " of the leucocytes seems to indicate more surely than any other sign the present reserve of immunity. So long as this examination shows an increase of young leucocytes compared with older ones it is wiser, so far as possible, to postpone any major operation.

The local criteria showing a demarcation of the process are to be judged chiefly by serial *x*-ray examinations of the lungs. So long as the films show large foci of fresh infiltration and spread, the indication for surgical treatment is not present. When the *x*-ray examination shows a demarcation in the form of excavation without further dissemination spontaneous retraction can be expected to begin; only then is it time for the surgeon to intervene, if the process is unlikely to heal by Nature's help alone.

Taking into consideration the principles here stated, the indications may be summed up as follows. Although artificial pneumothorax can be induced or attempted without any serious influence on the reserve power of the immunity, and should not be postponed until adhesions have formed, major surgery in pulmonary tuberculosis should be kept in the background until the power of immunity has been regained and the local findings show sufficient demarcation and retraction to justify operative relaxation. As a rule there is no risk in waiting until the conditions are the best possible. Surgical treatment should be considered an addition to Nature's spontaneous healing, making this permanent instead of merely temporary. Any procedure under conditions which are not in accordance with these principles should be carried out only on vital indication, and as such may be the only chance of helping the patient. Experience, however, shows that the results of operation on vital indication are very poor.

Principles of Technique

The theory of relaxing the tension of the affected part of the lung has modified greatly the technical problems of this treatment. Both in artificial pneumothorax and in thoracoplasty the original idea was to accomplish a total collapse of the lung. In artificial pneumothorax this was achieved by using positive pressures to keep the lung compressed, often to extreme degrees. In thoracoplasty the same idea made the total operation the usual one even in cases of localized upper lobe affections. These methods, still favoured by several schools, should be replaced by a more reasonable technique, the aim of which should be to secure sufficient relaxation of the affected part of the lung, while the sound parts are kept expanded, fit for continued function.

Thus from the principle of total collapse has developed the principle of selective relaxation. This development has several advantages. It saves respiratory function, thus causing less invalidity to the patients. It has reduced the risk of the operations, it has made it possible to perform most of the operations in one stage, and it has enlarged the field of intervention by extending it to bilateral cases, in which both lungs may be treated by these partial measures in varied combination. All these advantages have been obtained without loss of effect, for statistics show improved permanent results.

This is also due to another factor. Along with the limitation in extent, the modern technique has increased its intensity. Not only does it intend the least possible waste of function, but also it has been developed with the earliest possible effective closure of cavities in view. Many shortcomings of the old-fashioned methods have emphasized the importance of this demand. The way to achieve this is to individualize the technique according to the size and exact position of the cavity, and to secure the relaxation of the lung in such a manner that the retraction can take place in the correct direction—namely, concentrically. It may not be sufficient to obtain a simple collapse from the side towards the mediastinum; in many cases the relaxation from above downwards or anteroposteriorly is equally or even more important.

The progress which has been made in technique enables us to pay attention to all these details on which depends the success of the treatment. It is necessary to observe each case individually, and to study the exact position of cavities and the localization of adhesions to the chest wall before the suitable operative treatment can be planned. Not until one knows exactly where tension is present in the thorax should one attempt to relieve it.

Choice of Methods

Working along these main lines it is found that the problem involved in the choice between the innumerable methods suggested is simplified. At the same time the operator is encouraged to change from one method to the next, if the first one tried does not fulfil expectations.

(1) The first method to be tried in practically all cases is artificial pneumothorax. When this succeeds at once in producing a selective retraction no further measures are necessary. Unfortunately the number of such cases represents a small minority. The formation of adhesions is such an early feature in the course of pulmonary tuberculosis as to make an adhesion-free artificial pneumothorax very rare. Scarcely 10 per cent. of artificial pneumothorax cases will be found to be totally or practically free from adhesions; these, when present, are naturally localized around the focus of disease, the relaxation of which is all-important.

Instead of trying, by positive pressure in the artificial pneumothorax, to enforce the closure of the cavity against localized adhesions at the expense of the sound parts of the lung, an early recourse to cauterization is advisable. The operation of Jacobaeus deserves to be more widely applied than it has been up to the present. Through the thoracoscope one can ascertain whether the adhesions can be severed. The operation itself in experienced hands is of great value in increasing the efficacy and reducing the shortcomings of an artificial pneumothorax immediately as well as permanently.

The time ought to be past when a contra-selective artificial pneumothorax—which means that only the sound part of the lung is collapsed, while the affected part is kept expanded by large surface adhesions—is continued for months or years. Statistics show that such contra-selective artificial pneumothoraxes are not only of no benefit, but actually give the patients a slightly worse prognosis. To continue this state of affairs cannot be too strongly deprecated. An artificial pneumothorax of this type, where cauterization as a rule is not practicable, should be replaced, as soon as the general and local condition allows, by a selective thoracoplasty.

A word of warning against other methods suggested to help an ineffective or contra-selective artificial pneumothorax. Oleothorax, as a whole, is in disharmony with the principles of selective relaxation, and this may be the reason why severe and most disagreeable complications so often occur. In very special cases of lower lobe cavities this method may still be of some value, but its efficacy is so limited that it is considered justifiable to abandon it

altogether. Continuation of artificial pneumothorax combined with local operative treatment must as a whole be considered inadvisable. Either the artificial pneumothorax should be made effective, or it should be replaced entirely by a selective or total operation.

(2) The main surgical methods for replacing a contra-selective or impracticable artificial pneumothorax are: (*a*) interruption of the phrenic nerve; (*b*) apico- or pneumo-lysis with wax plugging; and (*c*) thoracoplasty.

Some other suggestions have been made, such as scalenotomy, interruption of the intercostal nerves, etc., but they do not deserve further attention in this survey.

(*a*) Evulsion of the phrenic nerve, crushing, alcoholization, or other methods of temporary and permanent interruption of the nerve have claimed an attention far beyond all reason, from the point of view of the main principles here stated. The phrenic operation is contradictory to the idea of selective relaxation when used in cases of upper lobe affections, which represent the great majority. The statement that the paralysis of the diaphragm acts equally well on the apex as on the base of the lung has not been verified by statistical research on the permanent results of this operation. The only effect which is certain is that paralysis of the diaphragm reduces considerably the function of the lower lobe. When the lower lobe is sound this reduction may be a great disadvantage to the patient; it may—as has been shown by recent research—be a handicap in establishing an effective operative relaxation of the apex. The sooner it is realized that phrenic interruption should be abolished in apical or subapical affections the better. The method, however, still has its uses, not as a " test operation," still less as a preparatory operation to partial upper lobe intervention, but only as an attempt to close cavities in the lower lobe, middle field, or near the hilus.

(*b*) Apicolysis, with plombage, when undertaken after exact localization of the cavity, may be considered the most selective of all methods. It is attractive also on account of the relatively small demand on the patient's reserves and its elegance as an operation. On the other hand, this method is handicapped partly by the tendency for serious complications to occur in the earlier or later after-treatment and partly by its effect being inferior to thoracoplasty. It has become more and more recognized that the closure of cavities takes place more slowly and less frequently after apicolysis than after a well-performed thoracoplasty. The final judgement on apicolysis has not yet been passed, but at the moment its popularity seems to be on the decline.

(*c*) Thoracoplasty, in virtue of its more modern technical improvements, is the method holding the leading place in this group of operations. Here particularly the intensity has been developed at the expense of extent, thus combining greater effect with less risk. " Total " or " subtotal " thoracoplasties with resection of eight to eleven ribs should now be reserved for the more extensive affections and the larger empyemas, while more localized affections should be treated by partial operations only. The types of operation which should now be adopted are the " upper partial " thoracoplasty, in which six or seven ribs are resected to treat upper lobe affections, and the " apical " thoracoplasty with resection of only four or five ribs to treat purely apical cavities. These two types of operation must be individualized according to the size and exact location of the cavity, the length of each rib resected being so planned as to allow complete retraction to take place. The two upper ribs especially may have to be removed in their entirety, which can be accomplished through the paravertebral incision alone.

Even the most radical removal of the upper ribs may yet be insufficient to close the larger or less accessible cavities. The most radical relaxation from the side towards the mediastinum is not always sufficient to close the cavity which remains as a slit between the collapsed chest wall and the upper mediastinum. This experience has made surgeons combine the operation of " partial-upper " and " apical " thoracoplasties with apicolysis (without plugging), performed extra-pleurally or extra-fascially. By this addition to the technique the suspension of the apex of the lung, or rather of its adherent parietal pleura, can be so loosened as to allow the apex to sink down in the collapsed thoracic cavity, and shrink not only from the side towards the mediastinum and antero-posteriorly but also from above downwards.

Results

The progress which the surgery of pulmonary tuberculosis has made, when performed along the lines here stated, is evident when the improvement in the results obtained is considered. This will be demonstrated in different ways from the material of Vejlefjord Sanatorium. The material, now amounting to more than 1,600 cases treated since 1907, including those of pure artificial pneumothorax, has recently been statistically reviewed. Many interesting details have been revealed by this examination, the value of which has been increased by the fact that it has been possible to trace 100 per cent. of the patients.

Out of the large statistical material only two tables will be demonstrated here, as proof of the progress which has been made.

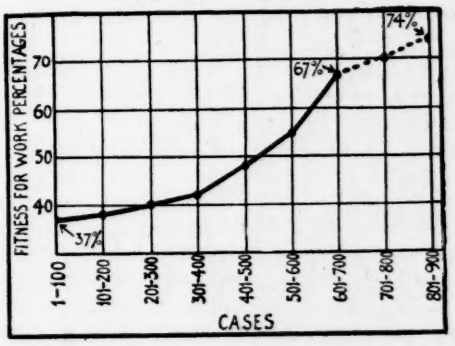
TABLE I.—*Operative Mortality in Thoracoplasty*

	Case Nos. 1-200	Case Nos. 201-400	All 400 Cases
At the end of first week ...	11=5.5 %	4=2 %	15=3.7 %
" " second week	(+4) 15=7.5 %	(+7) 11=5.5 %	(+11) 26=6.5 %
" " sixth week...	(+10) 25=12.5 %	(+7) 18=9 %	(+17) 43=10.7 %

1. The material consists of 450 cases of thoracoplasty operated on since 1916. The operative mortality is shown in the table, from which it will be seen that the risk connected with this operation has gradually been considerably reduced.

TABLE II.—*Fitness for Work in Percentages, Fifth Year after Discharge in each Consecutive 100 Count of Treatable Cases of Artificial Pneumothorax and Operative Treatment*

Vejlefjord Sanatorium, 1907–32



2. The accompanying curve shows the results of an examination of the permanent results in the first 900 cases considered suitable for " collapse " treatment (including artificial pneumothorax cases). The cases are well suited for comparison, since all hopeless cases which, particularly in the early days, were given a chance by one method or the other, have been excluded from the material. The 900

cases are tabulated in groups of 100 each. The results are judged by each patient's " fitness for work " in the fifth year after discharge from the sanatorium. In the first three groups, which refer exclusively to artificial pneumothorax, the percentage rises from 37 to 42 only. Then the curve begins to rise more rapidly; this coincides with the introduction of the various operative measures: thoracoplasties from the 200-300 group, cauterization from the 300-400 group. It will be seen that the curve has continued to rise throughout the groups until it has reached 74 per cent. in the 800-900 group—twice the figure of Group I. (Of the last two groups a decreasing number of patients have been able to be observed throughout the whole period of five years. But a careful calculation by percentage of the average mortality during the last one or two years of this period makes it possible to indicate the probable direction of the last part of the curve.)

This curve shows how, by the surgical work in combination with and in continuation of artificial pneumothorax, it is possible, more and more effectively, to help patients with pulmonary tuberculosis. The gradual improvement in the results is an encouragement to continue the progress.

(N.B.—During the course of the lecture slides of *x*-ray plates were shown, illustrating the various methods described.)

RATIONAL PNEUMOTHORAX TREATMENT

BY

G. T. HEBERT, M.D., F.R.C.P.

PHYSICIAN IN CHARGE OF THE TUBERCULOSIS DEPARTMENT, ST. THOMAS'S HOSPITAL

Argument

1. The reputation of artificial pneumothorax treatment for tuberculosis is based on striking successes in a minority of cases. In a larger number of cases not grossly dissimilar, either its success is only partial or temporary, or it fails completely.

2. The reason for this inconstancy of results lies in the fact that the treatment is not a specific for tuberculosis. Collapse is capable of providing certain kinds of help to the body in its fight against the disease, and that help may, or may not, be of the particular kind that an individual case requires.

3. Selection of cases should therefore be based upon an estimate of the kind of help required, and the subsequent control of the treatment upon the degree to which this help is provided.

4. The different kinds of help—styled " desired effects " —are discussed in this article, and a scheme of treatment, based on them, is outlined.

For some fifteen years artificial pneumothorax treatment has had a recognized place, and has enjoyed an increasing popularity, in the treatment of pulmonary tuberculosis in England. During this time it has been the means of restoration to health of a large number of patients; in fact, the striking results obtained in certain cases have been the chief justification for the use of the treatment and the extension of its scope. But too frequently it either fails, or succeeds only partially or temporarily, and the general results, though favourable, seem hardly sufficient to warrant the confidence that its adherents place in it. It is not, of course, a cure; it is merely an aid to the patient in his fight against the disease in the sense that it may be able to correct or remove certain conditions which are delaying or preventing the natural healing process. When a patient comes to us for treatment we should not, in effect, say, " Artificial pneumothorax treatment is recognized as a valuable form of treatment for tuberculosis, especially if the disease is unilateral. This patient should therefore be given the advantage of it, and perhaps it will prove a striking success." We ought rather to try to discover just what help the patient needs, and to use a pneumothorax only if there is a reasonable prospect that it will give that help. In other words, the treatment must be placed on a rational basis, rather than on an empirical. Unless this is done, the results will not improve and discredit may fall on what is, or might be, a very valuable remedy.

The object of this article is to suggest how the special needs of individual cases should be considered, to what extent artificial pneumothorax treatment can supply those needs, and how the progress of the treatment should be watched. The first section deals with some of the physiological and pathological results of collapse of the lung; the second with the possible therapeutic results in their bearing on certain types of case; and the third with the progress, control, and duration of treatment. In the fourth, points arising in the preceding sections are discussed.

1. The Physiological and Pathological Results of Collapse

Relaxation.—A lung is an elastic and expansile organ—that is, it can be distended. When distended it is under tension, and is therefore contractile. The greater the degree of distension the less the expansibility (i.e. a greater force is required to produce a given amount of further distension), and the greater the tension and contractility. In other words, tension and contractility vary directly, and expansibility inversely, with the degree of distension. Applying these principles to certain possible states of the healthy lung, we find that the compressed lung can expand to the size of the relaxed lung without increase of tension; that the relaxed lung can expand with, at first, only slight increase of tension; that the lung in expiration is under moderate tension; and that the lung in inspiration is under greater tension. Tension in the lung means that on any point in its framework an outward or centrifugal force acts. If at this point there is a tuberculous focus, the latter is subjected to this force which, moreover, alternately increases and decreases with inspiration and expiration, a state of affairs prejudicial to the formation of fibrous tissue. One important object to be attained by an artificial pneumothorax is therefore the abolition, or at least the material reduction, of tension in the diseased areas.

Decreased Flow of Blood and Lymph.—Collapse of lung may be considered to produce a decrease in the flow of blood and of lymph, though this fact does not appear to have been proved experimentally. The result is a reduction of toxaemia, and clinical evidence suggests that if toxaemia is reduced to the level at which evening pyrexia ceases, the formation of antibodies is at its maximum. This theory is the basis of treatment by graduated exercise, and by tuberculin, and accounts, in collapse therapy, for the healing of tuberculous lesions elsewhere, particularly in the other lung and in the larynx.

The Spread of Disease by Means of the Bronchi is Checked.—It is arguable, and to me probable, that spread of disease in a progressive tuberculous lesion takes place mainly by means of the air passages. According to this theory, a plug of infected mucus which is almost occluding a small bronchus will be drawn towards the periphery during the inspiration preceding cough, but will move very little in the opposite direction during the expiratory phase of coughing because the volume of air behind it is small, especially it the plug of mucus has caused local atelectasis, and because the plug of mucus, if drawn into the wider spaces at the base of the terminal lobule, can then allow

the expiratory volume of air to pass. Collapse of a diseased area of lung reduces the force of its inspiratory intake, and thereby the aspiration of infected material. The experiments of Ameuillé[1] with lipiodol show the effect of coughing in driving liquid material from the bronchi into the air spaces.

Conditions are made more Favourable for the Collapse of Cavities.—The state of pulmonary cavities is determined by the operation of three factors—necrosis, inflation, and fibrosis. When necrosis predominates, the volume of the cavity represents approximately the volume of lung tissue destroyed and removed. When inflation predominates, a small necrotic area is enlarged to form a space of considerable size, either by retraction of surrounding lung tissue or by the production of a positive pressure inside it. Fibrosis in the cavity walls renders it less collapsible, whereas fibrotic contraction of the area in which the cavity is situated tends to reduce the size of the cavity. Collapse of the lung may, therefore, primarily affect recent cavities by reducing tension which is producing inflation, and secondarily by removing any factor or factors responsible for a positive pressure inside it. It may secondarily affect chronic cavities by promoting fibrotic contraction of the diseased area.

Checking Haemorrhage.—Collapse of the lung tends to check urgent haemorrhage either by reducing the blood flow or, more probably, by aiding the formation of blood clot in the space into which bleeding is taking place.

2. The "Desired Effects" of Collapse

The "desired effects" in any particular case of tuberculosis may therefore be one or more of the following: relaxation of lung, reduction of toxaemia, checking of spread, closure of cavities, and cessation of haemorrhage. Collapse may, or may not, be able to produce the desired effect. If it can do so the prospects of successful treatment are good; if it cannot do so the treatment is useless or perhaps harmful.

The first essential for successful treatment is a correct assessment of the patient's needs. Certain suggestions for making this assessment are given later, but a short statement of the position may be given at this point. Healing depends mainly on two factors: (*a*) the possession of a resisting power to the disease, shown by the "fibrosing faculty," and (*b*) the suppression of mechanical conditions preventing adequate fibrosis. If the fibrosing faculty is present, the aim of treatment is to remove causes preventing its proper functioning, the chief of which, in pulmonary tuberculosis, is tension in the lung; if the fibrosing faculty is deficient, the primary need is an increase in the resisting power of the patient, which may be supplied, to some extent, by the reduction of toxaemia; if disease is spreading or likely to spread rapidly, or if cavities are considered to be a danger to the patient, the aim of treatment should be in these directions.

PRODUCTION OF THE DESIRED EFFECT

Relaxation.—When relaxation is the desired effect, reduction in size of the affected area must be obtained. The desired effect is being produced if good, or preferably selective, collapse is seen radiologically. By selective collapse is meant collapse more or less confined to the diseased area. This must be accompanied by some general improvement in the clinical condition of the patient, particularly as regards pulmonary symptoms, but the degree of collapse is at first much more important than an immediate clinical response. If selective collapse is not obtainable owing to the presence of adhesions, a progressive decrease in the radiological opacity of the affected area is necessary. Such a change should be noticeable within a few weeks, and should be progressive. In the average case the desired effect of relaxation may be considered to have been obtained satisfactorily if selective collapse is well marked after three weeks, or if the radiological opacity due to disease has disappeared in six months. In slighter cases these periods should be shorter.

Reduction of Toxaemia.—When the object of collapse is the reduction of toxaemia, the degree of collapse is relatively unimportant, but the effect on the temperature must be striking. The more quickly the temperature falls the better the prognosis, but in any case it should have returned to normal within a fortnight; and there must be a decided decrease in toxaemic symptoms. Definite reduction of pulmonary symptoms such as cough and expectoration need not be evident during the first few weeks. Satisfactory reduction of toxaemia is accompanied by evidence of healing of tuberculous lesions elsewhere, for instance in the other lung and in the larynx.

Checking of Spread.—When checking of spread is the primary object of collapse therapy, the case is usually a toxaemic one, so that the desired effect of reduction of toxaemia, and probably also of relaxation, must also be produced. The desired effect is being obtained if there is no radiological evidence of extension of the disease, and at the same time improvement of pulmonary and toxaemic symptoms is evident.

The Closure of Cavities.—Recent necrotic cavities should show a decrease in size in the first fortnight after induction of the pneumothorax. Good collapse of the affected area is necessary. Recent round cavities may disappear rapidly—that is, in a few weeks—or shrink concentrically, or become smaller and irregular in shape. In both types of case complete disappearance should have occurred in from two to six months, according to the severity of the lesion. Recent round cavities may become more obvious, and perhaps larger, with the institution of a pneumothorax. In spite of this the treatment should be continued, if there is clinical improvement in the patient's condition, for a period of perhaps three months, but not for longer unless pneumolysis is contemplated. It is not justifiable to continue beyond this limit in the hope that sudden closure may occur with the onset of an effusion. Phrenic interruption may assist in certain cases, but the closure, or apparent closure, so obtained is rarely as satisfactory as that obtained, in other cases, by artificial pneumothorax treatment alone. Necrotic cavities with a fibrotic, or partly fibrotic, wall rarely close completely, even if adhesions are not preventing collapse; in fact, a pneumothorax is, generally speaking, more liable to be harmful than beneficial in this type of case.

Cessation of Haemorrhage.—When instituted to control an urgent haemoptysis, the collapse should be immediate in its effect. No more fresh blood should be coughed up. If the bleeding recurs after a few hours the prospects of success are meagre, unless it is found that further collapse will establish control.

3. The Progress and Duration of Treatment

The period during which the desired effect is being produced is the period of the initial response. It is followed by the period of healing; and the duration of the treatment is completed by the safety margin.

The length of the period of healing is affected first by the duration of the initial response. If the response is rapid according to the standards outlined above, the period of healing is correspondingly shortened, and vice versa. Secondly, it is altered by the type of lesion. A given amount of tuberculous disease concentrated in a small area will presumably take longer to heal than the same amount of disease scattered as small discrete foci in a

much larger area. In the latter case healing can take place simultaneously in a large number of centres, and the time of healing is that required by a small focus. Thirdly, where necrosis has taken place so as to form cavities healing is slower than in cases without appreciable cavity formation.

The results of sanatorium treatment show that relapses occur particularly within the first two years, and this suggests that in the average case it takes two years of sanatorium treatment and subsequent life under modified sanatorium regime to effect healing that is adequate. In a satisfactory case undergoing artificial pneumothorax treatment it may be assumed that the rate of healing is more rapid, and that after a year it has advanced to the stage when it is no longer dependent on collapse therapy. The study of treated cases, and especially of similar cases in which the treatment was cut short by obliteration of the pneumothorax, also provides evidence for estimating rates of healing. A tentative guide to the period of healing may therefore be formulated, but the following suggestions for the different groups of cases apply only if progress is uninterrupted by complications.

A. In cases where relaxation was the desired effect, but selective collapse was not obtainable, it is suggested that the period of healing is six months plus the time taken for the disappearance of the original opacity. If this time were four months, the total duration of the treatment would be—attainment of desired effect, four months; period of healing, six months plus four months; safety margin, say, six months. Total twenty months. If in a slight case the first period were only six weeks, the total duration would be fifteen months. In a severe case, with a first period of one year, the total duration would be three years. A similar rule may be used for cases with selective collapse, the period of healing commencing when almost complete selective collapse has been obtained.

B. When reduction of the toxaemia is the desired effect, the suggested period of healing is six months for each week the pyrexia persisted after induction, plus six to twelve months according to the severity of the case. Thus in a slight case with abolition of the pyrexia in one week, the total duration, including six months' safety margin, would be eighteen months.

C. When checking of spread is the desired effect, the period of healing is that required for healing of disease under heads A, B, or D, whichever is longest.

D. When closure of cavities is the desired effect, at least one year should be allowed for healing from the time that the cavity ceased to be visible in the radiograph. The period should be increased if the cavity was not recent, or was more than an inch in diameter, or had a definitely fibrous wall. The latter point may not be easy to decide from radiological examination, for exudate and collapse of surrounding lung may produce a dense shadow round a recent cavity; serial radiographs may, however, show that the cavity wall decreases in thickness as the patient improves, and if so it presumably is not altogether a fibrous wall.

E. A pneumothorax induced to check severe haemoptysis should either be continued as treatment of the causative disease if the case is suitable for this form of treatment, or else be allowed to absorb at once, on the grounds that it has fulfilled its object and is more likely to be repeatable in a future similar emergency if the pleura is allowed to return to its normal state as soon as possible. Collapse for recurrent haemoptysis, apart from the treatment of the causative disease, should presumably be maintained for six months or a year beyond the time when a recurrence might have been expected.

In the preceding paragraphs it is assumed that complications have not occurred during the treatment and, in fact, complications, with the exception of effusion, are rare if the case has been properly assessed and the desired effects obtained within the specified times. If the desired effects are not all obtained but yet there is considerable improvement in the patient's condition, it is justifiable to continue the treatment, but only so long as the improvement is maintained.

THE SAFETY MARGIN

At the end of the period of healing the patient ceases to derive benefit from the pneumothorax, but a safety margin is advisable to allow for errors in the assessment of progress. A period of six months is suggested above. It might be, and sometimes actually is, argued that a longer period than this should be given on the grounds that the continuance of the pneumothorax does no harm and reduces the risk of relapse after its termination. There may, however, be advantages in terminating the treatment as soon as possible, namely, saving the cost of the treatment and the time of the physician; saving time off work for refills; allowing a patient to take some post where refills are not obtainable or where they would prejudice his employer; encouraging an introspective patient; freeing the patient from the risks of pleural shock or of other accidents, of an effusion which may have serious consequences, and of perforation; allowing more effective collapse of the contralateral lung. The argument that relapse may occur when the lung expands is no more than a confession of failure to understand the essentials of treatment. In a case properly chosen and properly treated, relapse in the lung so treated is improbable. If it does occur it probably would not have been avoided by continuing the treatment. Active disease does occur in patients who appeared to have done well under the treatment, but it is almost always fresh disease in the other lung, and probably is due to a new failure of resisting power when the stimulus to the formation of antibodies, which was provided by the original lesion, has disappeared.

Considerable help in the assessment of progress may be derived in the future from the blood picture and sedimentation rate, but it is not proposed to discuss them in this paper, nor phrenic interruption and gold salts as adjuvants to artificial pneumothorax treatment.

In the scheme outlined above, continuity of treatment is very desirable. It is most important that the physician who commences the treatment should be the one who continues and finally terminates it. Too often this is not the case in practice. Patients moving from one area to another may come under the care of a number of physicians in turn. *X*-ray films and other information of real importance are not always transmitted: details of the last three refills do not constitute all the transferable information that is required.

4. Discussion of Preceding Points

Relaxation and Rest.—It was argued above that one important object to be attained by artificial pneumothorax treatment is the abolition, or at least material reduction, of tension in the diseased areas; relaxation is more important than abolition of movement during inspiration. Fluoroscopic examination often shows that considerable expansion of the collapsed areas takes place during inspiration but, because the lung is relaxed, this expansion does not produce a tension comparable to that caused by a similar expansion of already distended lung. Collapse, in other words, does not prevent movement but it does prevent material increase of tension, and this reduction of tension may be sufficient to allow healing to take place. If the lung is severely affected complete relaxation of diseased areas is desirable; therefore when the whole lung is affected, complete collapse with a pressure sufficient to ensure complete relaxation even during inspiration may be necessary. When the disease is confined to one part, perhaps to one lobe, and the rest of the lung is healthy, the diseased and healthy parts respond differently to the expanding force of inspiration. The diseased part is less expansile, so that the force of inspiration acts mainly or entirely on the expansile healthy part, with the result that

some degree of respiration is carried out by the healthy part while the diseased part remains more or less motionless and relaxed. This selective collapse is preferable to complete collapse when a considerable part of the lung is healthy, and it can often be obtained. The following are suggested as possible ways in which it may be brought about:—(1) the contraction of fibrous tissue, (2) absorption of air from the diseased part, (3) deflation of the diseased part by expansion of the healthy part, and (4) compression during coughing without subsequent expansion. Of these four causes, (1) contraction of fibrous tissue undoubtedly aids selective collapse, but it is operative only after healing has commenced and must be looked upon as increasing rather than initiating that collapse. (2) Absorption of air from the diseased part cannot be proved, but it is reasonable to suppose that when a diseased area producing secretion is relaxed, the secretion will tend to collect in, and obstruct, the air passages, with resultant collapse of the distal air spaces. Such a cause of selective collapse would be operative especially in the earlier stages. (3) Compression of the diseased part by expansion of the healthy part depends on the situation of the diseased and healthy areas. Supposing, for instance, that a partial pneumothorax has been established in a patient with a diseased upper lobe and a healthy lower lobe, the upper lobe does not expand during inspiration; the lower lobe expands not only into the lower half of the thorax, but also towards the upper half. The upper lobe would be pushed upwards and inwards, and if such movement were restricted by fine adhesions or by rigidity of bronchi and mediastinum, the lobe would be compressed slightly. This theory, like the next, requires that when the compression ceases the upper lobe is not sufficiently expansile to return to its previous size. (4) The positive intrapleural pressure produced by coughing forces air out of diseased and healthy parts, but chiefly, of course, from the latter. During the succeeding inspiration air enters the healthy part readily because it is relaxed and therefore easily expanded, but it does not enter the diseased part at all readily because this part has been rendered less expansile by disease. In other words, the healthy part is compressible and expansible, the diseased part is somewhat less compressible but a good deal less expansible. The net result of compression exceeding expansion is deflation.

Of these four factors, the second, aided by the fourth, is probably the chief cause of selective collapse in the earlier, and the first in the later, stages.

Bronchial Stenosis and Inflation.—In the paragraph dealing with the condition of pulmonary cavities it was suggested that the production of a positive pressure may be responsible for the inflation of necrotic areas. The following theory shows how such a positive pressure may be produced if some degree of bronchial obstruction exists. After the inspiration preceding cough the glottis is closed and an effort is made to contract the thorax. The air within the thorax is thereby compressed. The glottis is then opened and as the compressed air rushes out the positive pressure in the several units of the lungs rapidly falls to the neighbourhood of the atmospheric. This fall of pressure will, however, be less rapid in any unit which cannot deflate as rapidly as the others on account of narrowing of its bronchus or bronchiole due to pathological or mechanical changes, and there will therefore be for a short time a pressure in this unit greater than in those surrounding it. Stenosis of a bronchus or bronchiole might in this way cause distension of a cavity, or potential cavity, during part of the act of coughing, to a degree varying with the degree of stenosis. Evidence of the existence of bronchial stenosis in tuberculosis has been produced by Eloesser.[2]

The Assessment of Needs

(1) *The Case Requiring Relaxation.* — The patient requiring relaxation of lung is one who possesses a fair degree of resistance but yet is unable to effect satisfactory healing of his pulmonary lesions. This failure, it is suggested, is due to mechanical rather than to biochemical causes; the resisting power is sufficient, but tension in the diseased areas prevents adequate formation of fibrous tissue. Such a patient usually gives a history of insidious onset, the disease having been slowly progressive. Pulmonary symptoms, such as cough and expectoration, and occasional haemoptysis, are more pronounced than toxaemic symptoms such as pyrexia, loss of weight and lassitude. The *x*-ray film shows a discrete mottling occupying often at least half of one pulmonary field. Because their clinical condition is relatively good and toxaemia is so slight, such patients are sometimes advised merely to lead a quiet life at home or to have a period of rest in bed at home or in a sanatorium. These measures are usually insufficient, particularly the first, whereas collapse therapy offers a very good chance of success, especially if the disease is unilateral or even unilobar.

(2) *The Case Requiring Reduction of Toxaemia.*—Here the main impediment to healing is the presence of the toxaemia, which, as clinical evidence suggests, prevents the proper formation of antibodies. Collapse is a more rapid and more effective method of reducing toxaemia than mere rest in bed, but is of little avail if the patient proves to be unable to respond. Clinically, such patients usually have a short history, with an evening temperature of 100° or over, tachycardia, loss of flesh, sweating, and lassitude. Pulmonary symptoms are also prominent. Radiologically the appearances conform with those of the bronchopneumonic type. Bilateral disease is not a contra-indication to collapse of the more affected lung, but unless immediate improvement is shown it is unlikely that the treatment will be successful, and its continuance may actually be harmful.

(3) *The Case Requiring Checking of Spread.*—When this is the chief " desired effect " the case is one with a short history and few symptoms, but a well-marked coarse mottling probably in the middle or lower zones on one side. Such patients may have been diagnosed as tuberculous by sputum or radiological examinations when they had been complaining only of a "cold," or sometimes have been discovered unexpectedly during routine contact examination.

(4) *The Cavity Case.*—The cavities most readily collapsible are the thin-walled annular shadow cavities, with perhaps little central translucency, situated in an area of recent discrete mottling. Up to 15 per cent. of such cavities, particularly those not larger than 2 cm. in diameter, will disappear with prolonged and complete rest in bed, and, according to Burrell,[3] such a cavity is not an indication for special treatment. But pleural adhesions are liable to form over cavities, and the disadvantage of conservative treatment lies in the fact that collapse treatment, if necessary later on, is less likely to be effective. Such cavities, if peripherally placed, should usually be treated by collapse at once. This is particularly the case in a well-defined type of lesion which may be termed the " right upper lobe type." Here a dense opacity occupies the lower part of the right upper lobe. It is sharply limited below by the transverse fissure, and it fades away in the subclavicular region, leaving the apex unaffected. Towards the upper border of the opacity, and often near the lateral border of the pulmonary field, is a faint annular shadow. Adhesions almost invariably form early in this situation. These cases respond very well to artificial

pneumothorax treatment, and by no means well to conservative measures. Collapse should be produced as soon as this type is recognizable, however slight the changes and however good the patient's general condition. Recent cavities, mainly necrotic, in a toxaemic case, should be collapsed at once. According to Fowler,[4] a mortality rate of 90 per cent. in five years in these cases is reduced by collapse therapy to 33 per cent. Here again delay reduces the chances of success. Middle and lower zone cavities are usually more collapsible than apical cavities, and are more urgently in need of collapse. Chronic cavities are not well treated by any form of collapse therapy; they may close partially, or almost completely, but rarely heal. In cases with fibrous apical cavities a pneumothorax may do more harm than good.

(5) *The Case with Haemoptysis.*—Collapse is often the best treatment for severe or recurrent bleeding from an artery exposed in a cavity, but it is essential that the cause and the site of the bleeding should have been correctly diagnosed. A large haemoptysis in a previously healthy young adult is probably of venous origin; collapse is unnecessary, for simpler measures suffice, and it introduces a grave risk of bronchopneumonia from retention of infected blood in the lung.

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[2] Eloesser: *Amer. Rev. of Tuberculosis*, xxx, ii, 123.
[3] Burrell: *Lancet*, 1933, i, 356.
[4] Fowler: *Tubercle*, xv, 4, 178.

DIET IN RELATION TO PHYSICAL EFFICIENCY*

BY

G. E. FRIEND, M.A., M.R.C.S., L.R.C.P.

MEDICAL OFFICER TO CHRIST'S HOSPITAL SCHOOL, HORSHAM

In regarding school and institutional diets in relation to efficiency the problem is not only one of the amount and balance of the foods consumed, but is vitally concerned with the quality of the raw material, its purchase and storage, its preparation for the table, and its proper service; further than this, the time allowed for the various meals, the number and the time spacing of these meals, and the amenities of the table must be considered, and lastly a factor that is often lost sight of, but is of equal importance, time and opportunity for proper evacuation of the waste products of digestion. That is, besides the construction of the dietary, the purchase, preparation, and ingestion of the food, and its proper absorption and disposal all require careful thought and careful control. Leaving the detailed consideration of the dietary for the moment, let me underline the commoner faults in institutional feeding. It will suffice to repeat the list I gave when writing on the subject of Public School Feeding in *Science Progress* in April, 1925.

1. The basis of diet tables is too often purely empirical.
2. Too short a time is allowed for meals.
3. Early school and chapel before breakfast are harmful.
4. Lack of variety in the daily menu.
5. Lack of proper service of meals.
6. Lack of adaptability of the diet scheme.
7. Lack of proper supervision of meals and too little regard for the amenities of the table and appurtenances.
8. Bad cooking.
9. Insufficient free time after meals, especially after breakfast and dinner.

The importance of the subsidiary factors in right feeding is, even to-day, not sufficiently recognized, and though it is right to acknowledge the increasing interest that is now being taken in many schools, both in the construction of diets and in the essentials of the dietary, these important aspects of the problem are not yet in all quarters sufficiently allowed for in practice even where they may be accepted in theory. To get the best results in education, mental or physical, you must first ensure good health, yet many people, including some school masters and more parents, would appear from their practice to regard good health as automatic, and ill-health as an unfortunate but inevitable accompaniment of school life. Children of school age, especially boarding school children, are animals in a state of physiological captivity, and like Sir Robert McCarrison's rats will pay equally the penalty for insanitary or ill-balanced conditions of either housing or food. After giving in clear and convincing detail his evidence on these points in his first Cantor Lecture, McCarrison says:

> "It may, therefore, be taken as a law of life, infringement of which will surely bring its own penalties, that the greatest *single factor* in the acquisition and maintenance of good health is perfectly constituted food."

Provision for Growth

In addition to the demands on the individual for the maintenance of body heat, the production of energy, and the repair of waste, the child of school age has to provide for growth, and for this reason the supply of both animal protein and animal fat required for healthy growth bears a higher ratio to the carbohydrate, and possibly to the vegetable protein and fat, than is either necessary or advisable in the case of the adult. From the early stage of infancy, when the ideal diet is wholly of animal origin, through childhood and adolescence the animal protein and fat should only gradually lessen in proportion to the carbohydrate and the vegetable protein and fat increase. For the production and maintenance of optimum health this change in proportion is often brought about too suddenly. Once full growth is attained and the amount of exercise taken begins to lessen, the great majority of Western peoples probably consume considerably more animal protein than they require. There is some evidence also that the marked rise in the consumption of patent cereal foods and sugar, more especially perhaps in the young, which has become established during the past fifty years, is one of the causes of much malnutrition.

It is, I think, fair to say that since the knowledge of the importance of vitamins and mineral salts as constituents of the diet became available and began to swing the dietetic view-point from the calorie value alone to a consideration of calorie plus balance, the data so far collected from the study of family and institutional diets merely serve to show us how little we really know about the fundamentals. The problem is still too much obscured by the old view, inevitable fifty years ago, of the importance of the calorie.

Until more exact knowledge is available, in the case of the growing human we must at present retain the standards and proportions now recommended as necessary for healthy growth. Indications, however, are not wanting that given more knowledge of this question of balance, especially in the case of the mineral salts and vitamins, the ideal diet will be found to require less protein and more fat in relation to carbohydrates than is at present regarded as necessary. Further, if the child and certainly if the adult could only be educated to eat economically and with that reverence for the function of proper mastication that its importance demands, the total calorie value needed would prove to be much less than is now considered advisable for safety. To attain this, however, school authorities will have to alter their time-tables to allow sufficient time for meals,

* Read in the Section of Medical Sociology at the Annual Meeting of the British Medical Association, Oxford, 1936.

and the public will have to be educated to the belief that commercial refinement of foodstuffs, especially of the cereals, is not a criterion of either their usefulness or their completeness as foods.

Construction of the Diet

It is generally accepted that an adult man doing light work requires on an average a total daily intake of 3,400 calories. A boy of 14 to 18 years of age requires just as much, some boys needing more and some less, according to their height, rate of growth, and range of activity. The mean age of the average public school is usually about 15 years, and will vary by some months about this mean from September to July; this variation depending upon admissions and discharges during the school year. The mean age is lowest in September and highest in July. In a school population of from 250 to 500 boys the plus or minus requirements as regards calorie values of individuals will approximately cancel out, and it will therefore be safe to allow one man-value for each boy—that is, 3,400 calories per head. Given proper supervision of meals and proper service those whose individual requirements are more than one man-value will average out with those boys whose requirements are less.

At Christ's Hospital the boys' ages vary from 9 to 19, and the mean age of the school is from twelve to fifteen months less than that of most public schools. During the last six years reasonably satisfactory results have been obtained as regards growth with a diet the average calorie value of which varies from 2,900 to 3,200 calories according to seasonal changes.

The diet should be planned to give the following proportions, which are taken from the table given in the *Report of the British Medical Association Committee on Nutrition*, page 12.

Daily Requirements of an Adult Male of Calories, Protein, Fat, and Carbohydrates

Derived from	Quantity in Grams	Percentage of Total Calories	Number of Calories
First-class protein ...	50	6	205
Second-class protein ...	50	6	205
Fat	100	27	930
Carbohydrate	500	61	2,050
Totals	700	100	3,390

For growing children I would prefer to increase the fat by the inclusion of at least one pint of milk per day and to decrease the carbohydrate proportionally, making the reduction in sugar. The milk should be given as milk, and not in extra milk-puddings. In addition to the correct calorie value and the proportions of protein, fat, and carbohydrate in the diet being maintained, watch must continually be kept to ensure that vitamins and minerals are present in safe amounts.

Vitamins and Minerals

Vitamins A, B complex, C, and D are necessary to maintain health and growth, and an excess supply of one will not compensate for a shortage in another. The best way to guard against possible deficiency is to use as great a variety of foodstuffs as possible, and always to include milk, cheese, Australian or New Zealand butter, fresh vegetables, and fruit. In the average school diet some lack is most likely in the case of B and D.

Vitamin A is safeguarded if butter, milk, cheese, egg-yolk, and liver are included; the vitamin B complex by the use of whole cereals, yeast, peas, beans, lentils, vegetables (both root and green), fruits, milk, cheese, egg-yolk and meat offals such as liver or kidney; D, especially liable to be short or even almost absent in winter, is ensured by the use of Australian or New Zealand butter; C, by fresh vegetables and fruits, potatoes, carrots, etc. Cod-liver or halibut-liver oil is a potent source of A and D, and can be used to help out any unavoidable shortage of these vitamins, but it is obviously better to ensure their inclusion in the diet. Probably the B group is that most likely to be short in school diets, depending as it does mainly on the inclusion of whole grain cereals. The vitamin and mineral content of whole-meal flour depends on the amount of coarse bran and middlings removed, and on the amount of white flour admixed for the purpose of producing an economic texture in the loaf. Consequently there may be much less vitamin and mineral salts present than the term "whole-meal" leads one to expect. The term whole-meal does not necessarily imply "whole grain." Of the eleven inorganic elements required for growth and the maintenance of health the more important deficiencies are likely to occur in calcium, phosphorus, iron, and iodine.

Given adequacy in all the above directions, the daily food is best divided between three meals only—breakfast, dinner, and tea. The stomach requires rest as much as any organ, and for this reason alone extra meals such as a light tea, before the high tea or supper, and the mid-morning or ante-breakfast snacks are better avoided. A five or five-and-a-half hour interval between meals is not too long, and conduces to a sharpened appetite and to the avoidance of waste.

Clinical Malnutrition

It is difficult to produce lists of cases of illness that conform strictly to textbook description or that correlate with alterations in diet or school routine as closely as will satisfy either the critical clinician or the statistician, but taking the wide view and looking at the dietetic, physical, and clinical picture shown by the twenty years' survey of the boys at Christ's Hospital it is impossible to avoid the conclusion that the provision of a more perfectly balanced diet, as soon as knowledge and opportunity allow, would go far to remedy much of the minor invalidism that at present handicaps and reduces the efficiency of the modern school child. The more striking features in this survey are:

1. The attack rate of fractures went up markedly with the substitution of vegetable margarine for butter, and returned to normal when butter was reintroduced into the diet.
2. A progressive fall in the incidence of acute and subacute rheumatism was coincident with an increase of animal fat in the diet.
3. During the war an increasing number of boys showed an inability to cope adequately with the ordinary school routine, coincidently with a physical regression.
4. Gastro-intestinal disorders of various kinds have shown a decline with improved conditions of feeding.
5. While cases of pyrexia of unknown origin have markedly decreased, catarrhal conditions and colds have increased, even if the factors of increased care, etc., be allowed for, with an increased diet.
6. Minor sepsis, boils, and whitlows since 1923 have increased almost coincidently with an increase in sugar, again even after allowing for increased care, notification of cases, etc.
7. There has been an increased frequency of complications in influenza since the diet has been increased.
8. Finally, the height and weight records show increases corresponding to improvements (or increases) in the diet, but apparently though this increase in diet has been enough to re-establish the normality of bodily growth, it is not yet enough to ensure a proper resistance to infection. I believe this to be a matter of right and wrong balance.

Conclusion

The diet at Christ's Hospital, though much improved in amount and quality, is still far from perfect. Sugar is too plentiful, fresh fruit and vegetable too scarce. Milk is now over one pint per head per day, and many of the younger boys have raw milk at tea. The bread, though reputed whole-meal, has a 20 per cent. admixture of white flour to allow of a finer texture, while the 80 or 90 per cent. flour used is itself only 82 or 92 per cent. of the whole grain. There is thus here a possibility of B complex shortage.

If the various requirements I have outlined in this paper could be adequately dealt with, and the balance of the diet be improved and corrected by means of the knowledge that is now being acquired through research, there is little doubt that both the health and the efficiency of the school child would soon present a much less disquieting picture than it has up to the present time.

RATIONALE OF FREE SCHOOL MEALS*

BY

E. H. M. MILLIGAN, M.D., D.P.H.

M.O.H. Glossop

In 1934 school meals to the number of 68,100,000 (including milk meals) were provided free to elementary school children in England and Wales. In Glossop £774 was spent to feed 642 children, and in addition 748 children paid for milk under the Milk Marketing Board's scheme at the rate of ½d. for one-third of a pint. Our school population is about 2,200. The fact that meals are provided is an admission of deficiencies in the home diet, and also that these deficiencies are likely to cause defects or disease. It will be useful to consider if there is any evidence that deficiencies in the home diets are responsible for any defect or disease, including poor physique, stunted growth, bodily deformity, lack of strength and endurance, or, to use one word to include all these conditions, malnutrition.

In Glossop I made graphs of the W/H ratio of school boys and girls, comparing the children in the very distressed area of Hadfield (between 40 and 50 per cent. unemployed) with the rest of the borough (about 20 per cent. unemployed); I also made graphs of the children of employed and unemployed persons, comparing in all cases these graphs with one compiled from the Board of Education Anthropometric Review of 1927. It will be seen that, generally speaking, the children in the distressed area have a lower graph than the others, and that the children of the unemployed have a lower graph than children of the employed or the Board of Education standard.

In Glossop 13 per cent. were referred for treatment among the Hadfield (distressed area) children compared with 7 per cent. of the other Glossop children, and 15 per cent. were referred for observation from the distressed area as compared with 8.6 from the other area. In carrying out functional strength and endurance tests I found that children of unemployed parents had less strength and endurance than children of employed parents; but I am glad to say that by school feeding things have been improved.

There can be no doubt that disease can be, and is, in a certain manner related to deficiencies in diet (cf. McCarrison, Cantor Lectures, 1936). This is of course admitted by the fact that the feeding of elementary school children to maintain their adequate nutrition is now a duty of the local education authority. The problem before us, then, is to see how the children attending our elementary schools can be maintained in health by the giving of school meals. To solve that problem two things must be known: (1) What is an adequate dietary to maintain health? (2) How far short of this standard is the home dietary of the children?

First as regards standards:

British Medical Association Standard

	First-class Protein	Total Protein	Fat	Carbohydrate	Calories
	grams	grams	grams	grams	
Per unit man-value per day	50	100	100	500	3,400

Diet in Poor Law Children's Homes (Ministry of Health, 1932)

	First-class Protein	Total Protein	Fat	Carbohydrate	Calories
	grams	grams	grams	grams	
Per child	42	76	108	349	2,749
Per unit man-value as per M'Gonigle and Kirby	53	101	144	465	3,663

The League of Nations Technical Commission drew up a table (Table I, giving details of the diet recommended for children from 3 to 5 years with 1,400 calories), and pointed out that the amounts of protective foods in this table would be adequate for children of 10 to 15 years with, of course, more energy-producing food to give adequate calories. I give this table and also another (Table II) in which I have adapted it to a school child

TABLE I.—*Age 3–5 (1,400 Calories, Daily Quantities)*

Food	Amount	Calories	Protein
	grams		grams
A. *Protective foods:*			
Milk	1,000	660	32
Egg	48	70	6
Meat, fish, or liver	30	40	6
Green leafy vegetables	100	30	3
Potato	150	150	3
Cod-liver oil	3	30	—
A source of vitamin C (raw vegetable or fruit)			
B. *Supplementary energy-yielding foods:*		980	50
Fats (butter if possible)	7	55	—
Cereals (as bread)	125	400	17
Totals		1,435	67

TABLE II.—*Age 9½ (adapted from above table)*

	Daily Quantities	Calories	Protein (grams)	Cost per week
				s. d.
Milk	1.65 pints	660	32	2 11
Egg	1 (1¾ oz.)	70	6	7
Meat, fish, or liver	1½ oz.	50	6.7	9
Green vegetables	3½ oz.	30	3	5
Cod-liver oil	1½ drachms	60	—	1
Potato	12 oz.	340	7	5½
Fat (butter if possible)	1 oz.	220	—	7
Raw vegetable or fruit (as orange)	4 oz.	60	0.8	7
Cereals (as bread)	5 oz.	450	20	4½
Treacle	⅝ oz.	76	—	1
Totals		2,016	75.5	6 10

* Read in opening a discussion in the Section of Medical Sociology at the Annual Meeting of the British Medical Association, Oxford, 1936.

(boy or girl) of 9.5 years ; in this table additional calories could be obtained by adding a little more carbohydrate—for example, treacle, which helps the swallowing of the cod-liver oil: it also contains iron.

Stiebeling's (Bureau of Home Economics, U.S.A.) calorie requirements for a boy of 9–10 and a girl of 11–13 is 2,400, and protein requirement 75 grams. The League of Nations Commission advises 1,920 calories for a male or female of 9 to 11 years and protein requirement 2.5 grams per kilo body weight. Average weight* of a boy or girl at 9½ years is approximately 57 lb. ; therefore the protein requirement at 2.5 grams per kilo is approximately 65 grams.

Now what are the actual home dietaries? M'Gonigle and Kirby in their book *Poverty and Public Health* (page 253) give a table showing diet analyses of various groups of Stockton-on-Tees wage-earners as follows.

TABLE III.—*Food purchased by 126 Stockton-on-Tees Families (per unit man-values per day)*

	First-class Protein	Total Protein	Fat	Carbo-hydrate	Calories
	grams	grams	grams	grams	
B.M.A. minimum ...	50	100	100	500	3,400
Income only:					
25s. to 35s. Group 1	23.6	68.8	81.2	444.0	2,831
35s. to 45s. ,, 2	25.9	72.2	80.9	436.1	2,845
45s. to 55s. ,, 3	26.6	72.0	91.7	427.0	2,872
55s. to 65s. ,, 4	48.9	99.1	111.6	485.2	3,480
70s. to 80s. ,, 5	50.4	112.4	125.0	561.7	3,950

From this table it will be seen that there is a shortage of first-class protein in Groups 1, 2, and 3, and elsewhere it is pointed out that the money available to buy food was per man-value per week: Group 1, 4s. 3d. ; Group 2, 4s. 4d. ; Group 3, 4s. 11d. ; and Group 4, 5s. 9½d. ; while the actual cost of the standard B.M.A. dietary was 7s. per man-value per week.

In his book *Food, Health, and Income* Sir John Boyd Orr divides the population into six groups as follows:

TABLE IV.—*Classification of the Population by Income Groups and Average Food Expenditure per Head in each Group*

Group	Income per Head per week	Estimated Average Expenditure on Food	Estimated Population of Group	
			Numbers	Percentage
1	Up to 10s.	4s.	4,500,000	10
2	10s. to 15s.	6s.	9,000,000	20
3	15s. to 20s.	8s.	9,000,000	20
4	20s. to 30s.	10s.	9,000,000	20
5	30s. to 45s.	12s.	9,000,000	20
6	Over 45s.	14s.	4,500,000	10
Average	30s.	9s.	—	—

He made surveys of 2,640 family budgets in Newcastle, Manchester and District, Stockton-on-Tees, Merseyside, and England and Wales (by Women's Co-operative Guild) and 138 middle-class British home budgets. As a result of his investigations he found that the diet in Group 1 was inadequate in all the constituents considered ; Group 2 was adequate in total protein (not first-class) and fat ; Group 3 was adequate in protein, fat, and calories, but the diets in Groups 2 and 3 were deficient in minerals and vitamins ; Group 4 was probably deficient in calcium ; Group 5 had barely a sufficient margin of calcium ; and Group 6 exceeded the standard in everything.

It will be seen, then, that large masses of the population, including school children, actually have inadequate dietaries, especially in protective foods, including minerals and first-class protein. How then are we to make up this deficiency in our arrangements for school meals? To that there can be only one answer: we must find out what the actual dietary deficiencies are in each area and supply the missing constituents in the school meals. To ascertain the actual and exact local deficiencies may take time, so in Glossop we have adopted preliminary measures as follows.

For the past two years school children have been given milk and sandwiches, thus receiving those articles of food which are necessary for health, but which the parents are unable through poverty to provide for them in sufficient amount. One, two, or even three bottles of milk (of 1/3 pint each) are given with each sandwich, which, with one bottle of milk, has the following approximate composition in grams:

	Animal Protein	Total Protein	Fats	Carbo-hydrate	Calcium	Phos-phorus	Iron	Value in Calories
	grams	grams	grams	grams	grams	grams	grams	
Sandwich and ⅓ pint milk	10.9	17.6	23.90	37.0	0.427	0.378	0.0034	454
Sandwich and ⅔ pint milk	17.1	23.8	31.56	46.0	0.655	0.555	0.00355	576
Sandwich with 1 pint milk	23.3	30.0	37.80	55.0	0.884	0.738	0.0035	698

The ingredients of the sandwich (latest variety with added yeast) are: whole-meal bread, 2 oz. ; butter, 1/2 oz. ; dried brewers' yeast, 1/8 oz. ; mustard and cress or watercress or tomato or lettuce (as in season), 1/2 oz. ; and, in addition, cheese, 3/4 oz. on Monday, Wednesday, and Friday ; 1/3 egg, 5/8 oz. on Tuesday ; beef or liver, 5/8 oz. on Thursday. It will be noticed that the ingredients of this supplementary meal are very similar to the food recommended in the League of Nations report.

We have tried to give food which contains a large amount of high-grade animal protein and fat ; vitamins A, C, D, and the complex B vitamin and minerals.

Now let us refer back to the analysis of the sandwich and milk meal. Sir John B. Orr (*Food, Health, and Income*) states (quoting Stiebeling in part) that the requirements of a boy of 11–12 years and a girl of 13 and over are:

Protein	Calcium	Phosphorus	Iron	Fat	Calories
grams	grams	grams	grams	grams	
75	1.0	1.2	0.0115	98	2,500

The League report recommended that of the protein 44 grams should be from milk, egg, meat, fish, or liver, and 3 grams from green leafy vegetables. Sir John Orr in his investigations found that each person in Group 1 received during the whole day the following amounts in grams in their dietary: protein, 63.4 (of which 22.5 was animal) ; fat, 71.6 (animal 50.7) ; carbohydrate, 348 ; calcium, 0.37 ; phosphorus, 0.81 ; iron, 0.008 ; calories, 2,317.

From investigations in Glossop of fifty-two home budgets I find that the quantity and quality of the food of the unemployed and lower-paid wage-earners is about the same as this Group 1 of Orr's. Now take the figures of

* Anthropometric Committee, Board of Education, 1927.

the constituents of this low-grade dietary and add to it the amount of each received in the milk and sandwich meal.

	Animal Protein	Total Protein	Animal Fat	Total Fat	Carbohydrate	Calcium	Phosphorus	Iron	Calories
Orr's Group 1 diet in grams	22.5	63.4	50.7	71.6	348	0.37	0.81	0.008	2,317
Milk and sandwich meal and ⅓ pint milk	17.1	23.8	31.3	31.56	46.0	0.655	0.555	0.0035	576
Total of Group 1 diet and sandwich meal	*39.6	87.2	82.0	103.16	394.0	1.02	1.365	0.0115	2,893
Standards advised by Stiebeling and Orr	*25	75		98		1.0	1.3	0.0115	2,500

* The League of Nations report suggests 44 grams of animal protein for a *growing* child; the additional 1/3 pint of milk as mentioned below would give this.

It will be seen at once that the diet of the poor plus the milk and sandwich meal approaches the recommended standard. Another 1/3 pint of milk is sometimes given with the milk sandwich meal to big growing boys and girls who do not progress. The Glossop school supplementary meal is very rich in high-grade animal protein (needed for growth). Through its whole-meal bread, liver, and yeast, etc., it is rich in vitamins B_1 and B_2; vitamin A is supplied by the large amount of animal fat in the butter, cheese, and milk; C is contained in the raw vegetable, and D in the butter. The sandwiches are so cut (in halves and quarters) that the amount given can be varied according to age.

It is usual to take the heights and weights and assess the condition of the children clinically by watching the progress of those having school meals. In addition, I would like to point out the desirability of testing also their strength and endurance: by the dynamometer for strength (estimating by pull in lb. over weight in lb.), and by some such test as the hanging bar for endurance. This latter test is conducted by getting a boy or girl to hang on a horizontal bar and noting with a stop-watch the number of seconds he or she can hang on. I would also emphasize the advisability of some such tests in the case of malnourished children before they are allowed physical exercises, as excessive exercises in such children may be harmful.

Summary

1. The home diets of large numbers of school children are deficient to an extent likely to cause malnutrition, judging malnutrition as a complex condition associated with (*a*) poor physique; (*b*) deficient growth (council schoolboys aged 14 were found to be 3.1 in. shorter than Christ's Hospital boys and 5.7 in. shorter than the boys in a large public school); (*c*) clinical defects and diseases; (*d*) deficient strength, estimated by pull in lb.; and (*e*) endurance and also perhaps instability (as body weight judged by the Romberg test).

2. The extent of the deficiency should be ascertained locally by home budget inquiries carried out by the M.O.H. or S.M.O. and assisted by the appropriate Government Department.

3. The constituent missing from the diet should be supplied by a system of school meals in such a way that through home and school feeding the child obtains an adequate and balanced diet.

4. Functional tests of strength and endurance should be carried out among school children to see if they are fit for the physical exercises curriculum, such tests being done by those responsible for the exercises in co-operation with the S.M.O.

Abstract from Budget Analyses of 52 Working-class Families in Glossop

Total income per week of 52 families, £108 0s. 4d. Total expenditure on food per week, £60 0s. 10¾d. Total man-value of 52 families, 229. Total amount of income per week per man-value, 9s. 5½d. Amount spent on food per week per man-value, 5s. 3d. Total amount spent by 52 families per week on overhead charges (rent, heating, lighting, clubs, and insurance), £40 12s. 2d. Amount spent per week per man-value on overhead charges, 3s. 6d. Total individuals in 52 families, 277. Total income *per head* per week in 52 families, 7s. 9½d. Total amount spent on food per week *per head* in 52 families, 4s. 4d. Total amount of overhead charges *per head* per week, 2s. 11d. Sir J. B. Orr's Group 1, amount spent on food *per head* per week, 4s.

PARALYSIS DUE TO POSTURE

BY

E. B. CLAYTON, M.B., B.Ch.

DIRECTOR OF PHYSICAL TREATMENT DEPARTMENT, KING'S COLLEGE HOSPITAL

The following cases of nerve paralysis, which are apparently due to pressure during the maintenance of some posture, have been collected from the notes of patients attending the Physical Treatment Department of King's College Hospital during the last ten years.

Anterior Tibial Nerve Paralysis

Case 1.—In a woman, aged 59, there was a sudden onset of foot-drop when she was kneeling to clean a grate in April, 1926. On examination the external popliteal nerve was found to be tender and thickened at the neck of the fibula. Only the anterior tibial group of muscles were affected, the peroneus longus and brevis being normal. The faradic reaction was present but reduced, in April; by July it had completely disappeared. However, there was return of fairly strong foot dorsiflexion by September.

Case 2.—A man, aged 42, had a sudden onset of foot-drop while gardening in a crouching position in March, 1926. Only the anterior tibial group of muscles were affected. There was a history of a wound in the thigh during the war, but there was no paralysis at that time. The duration of paralysis was sixty days.

Case 3.—A man, aged 23, had sudden foot-drop after kneeling for over an hour in October, 1923. It lasted for twenty-four days.

Circumflex Nerve Paralysis

Case 4.—A woman, aged 52, discovered paralysis of the deltoid muscle on waking one morning in February, 1936. She was suffering from fibrositis in the scapular region following an attack of influenza previous to the paralysis, the duration of which was two weeks.

Case 5.—A man, aged 37, discovered paralysis of the deltoid muscle on waking one morning in March, 1936. The paralysis disappeared in a short time, but returned the following day. He had been previously suffering from fibrositis in the scapular region, and for a fortnight before the paralysis developed cramp if sleeping on either arm. The duration of the paralysis was only a few days.

Ulnar Nerve Paralysis

Case 6.—A lad, aged 21, experienced a sudden onset of ulnar paralysis when riding a bicycle in April, 1932. He had had this before, when it only lasted one day, but the duration on the second occasion was twenty-six days. The paralysis only affected the intrinsic hand muscles, and was apparently due to pressure of the hand on the handle-bar.

Musculo-Spiral Nerve Paralysis

Case 7.—A man, aged 52, suddenly developed wrist-drop after lying down for about fifteen minutes with the hand behind the head, in February, 1926. It was a wet evening. On examination the musculo-spinal nerve seemed to be thickened at the middle of the posterior surface of the humerus. The paralysis lasted for eight weeks.

Case 8.—A man, aged 37, had a sudden attack of wrist-drop after sleeping in a chair on a Saturday night after indulging in alcohol, in December, 1927. The duration was thirteen days.

Case 9.—In a man, aged 31, there was sudden onset of wrist-drop after sleeping with one arm hanging over the side of the bed, in January, 1928. He denied alcohol as the cause. He returned to work after fifteen days, not completely recovered.

Case 10.—A man, aged 37, had a sudden onset of wrist-drop after falling asleep with his head on his wrist, in January, 1933. It lasted for seven weeks.

Case 11.—In a man, aged 68, a sudden onset of wrist-drop occurred from the pressure of an arm over a chair in February, 1935. His teeth were very septic. It lasted for two months.

Case 12.—A man, aged 40, woke up with right wrist-drop in June, 1930. He came to hospital five days later, when weak active extension of the wrist had returned. No note is available as to the duration of treatment.

In the four following cases, wrist-drop developed suddenly without any history of pressure on the musculospiral nerve.

Case 13.—A man, aged 59, developed wrist-drop one Sunday morning, with pains in the scapular region, in January, 1931. It lasted four months.

Case 14.—In a woman, aged 32, wrist-drop developed suddenly one afternoon in June, 1932. There was a history of rheumatism in the shoulder one month before, but there had been no pain immediately before the onset of the paralysis. No note was made of the duration of treatment.

Case 15.—A lad, aged 18, had wrist-drop one evening after work, in September, 1932. It lasted for twenty-three days.

Case 16.—In a man, aged 58, wrist-drop came on suddenly while he was resting his elbow on the padded arm of a chair, in November, 1929. There was thickening of the musculospiral nerve near the external condyle of the humerus. The duration was five weeks.

The following two cases of ulnar nerve paralysis also occurred without any history of pressure on the nerve.

Case 17.—In a woman ulnar nerve paralysis developed suddenly in September, 1926. The hand had been "going numb" over the ulnar cutaneous area for some time previously. There was thickening of the ulnar nerve above the elbow. The duration was ten weeks.

Case 18.—In a woman, aged 58, ulnar nerve paralysis developed suddenly after she had finished her washing, in September, 1935. The ulnar nerve was thickened above the elbow. The paralysis lasted for seven weeks.

These last six cases show that paralysis, presumably from perineuritis, may develop suddenly without pressure, and, in some cases, without any previous pain or numbness.

Transient Paralyses

An effort was made to discover to what extent minor cases of pressure paralysis occur which do not last a sufficient time to require treatment. Inquiries from hospital out-patients showed that the foot may "go dead" on crossing the knees, and that the hand or occasionally the whole arm may "be dead" on waking in the morning. This "deadness" clears up quickly on movement. In many cases it only occurs occasionally, and seems to be associated with cold and damp weather, or fatigue. I could not obtain any history of foot-drop or wrist-drop.

By making inquiries from people with a knowledge of anatomy I found that:

1. Ulnar paralysis on waking in the morning, after resting the arms on the side of a chair, or from sleeping with the hands behind the head, is fairly common.

2. The foot may "go dead," but only rarely do the leg muscles become definitely paralysed by sitting with the knees crossed.

3. In a few cases the whole arm is occasionally paralysed on waking in the morning.

These paralyses always clear up quickly on movement. In several instances they did not occur regularly, and were more likely to occur in damp and cold weather or when the person was fatigued. In one case the presence of a septic focus increased the intensity and frequency of occurrence, but did not seem to increase the duration. Thus the causes are similar to those of fibrositis, with which it is often associated. I could find no case of wrist-drop or of foot-drop from kneeling.

Points of Interest

The twelve cases of pressure paralysis due to posture represent the total number which attended the Physical Treatment Department of King's College Hospital during ten years. Since, presumably, all patients of this type who attended the hospital would be ordered physical treatment, the number seems very small, considering that several of the postures in which paralysis occurred are regularly assumed.

No cases of ulnar nerve paralysis from pressure on the arm, or of foot paralysis from crossing the knees, occurred in this series, though these two types are frequently found in the mild form which clears up on movement. On the other hand, I could not trace any mild cases of wrist-drop on waking in the morning, or foot-drop after kneeling, which recovered too quickly to require treatment, either among hospital patients or friends.

No patient came a second time to the hospital with a recurrence of the paralysis. This is a point against any anatomical peculiarity being the cause.

The fact that the majority developed in the colder months of the year suggests that cold and damp may be a predisposing cause.

The external popliteal division of the sciatic nerve was compressed from kneeling rather than the internal division. Presumably the nerve must have been compressed between the biceps tendon and the fibula.

The six wrist-drop cases were in men, and of the four cases of wrist-drop not due to pressure only one was in a woman. In only one case was a history of paralysis following indulgence in alcohol obtained.

The electrical reactions varied. In one case the faradic reaction disappeared, but in the majority it was normal or slightly reduced, and the galvanic reaction was rather sluggish.

Conclusion

Some of these cases can be explained as perineuritis with added pressure. A few were probably due to pressure only. It seems likely that in the others fatigue, cold and damp weather, or a septic focus may have been the predisposing cause. It would operate by affecting the circulation of the limb and making the nerve more sensitive to pressure without actually causing a perineuritis, since this variation in sensitiveness to pressure is found to be of common occurrence.

H. Vignes (*Progrès Med.*, May 30th, 1936, p. 921) states that according to W. H. Perkins the gravity of spirochaetal jaundice in pregnancy is closely related to the height and duration of the fever. Renal involvement is a bad sign. Haemorrhages are not specially frequent at the time of delivery. Interruption of pregnancy is not uncommon. Experimentally Mirto observed it in 70 per cent. of his animals. In human subjects abortion or premature delivery may be met with, especially in the Tropics and under unfavourable hygienic conditions. Abortion is particularly frequent in Japan, where severe forms of spirochaetal jaundice are common. The foetus as a rule is infected. No special treatment is indicated.

Clinical Memoranda

Manual Dilatation of the Pelvis

The following notes and comments on a recent case may help some colleague.

The patient was a primipara aged 36, stumpy of build, with a slight flattening of the pelvis. The presentation was an imperfect breech, and the patient was to have been sent to hospital in the course of a few days (the thirty-ninth week).

The membranes ruptured without warning at 5 a.m. (March 28th), and pains were of normal regularity and strength from then onwards. By 5 p.m. there was still no suggestion of dilatation of the cervix, which was of the shape and size of an average adult male forefinger, with a mere dimple os. No presenting part could be reached. By 2 a.m. there was a slight difference in the shape of the cervix, the base being a little broader, and the "dimple" sufficiently widened for the actual os to be appreciated with the finger-tip, but the condition of the patient (who had a bronchial cold) indicated that the labour should be terminated. The flat of the foetal sacrum could just be reached lying across the inlet.

Beginning to deliver, I was much taken aback to find that the smallness of the bony outlet would not permit my hand (which is of average size) to enter the vagina. There was no possibility of delivery by any other way. The time was 3 o'clock on a Sunday morning, in a remote spot and dirty weather.

By levering and pulling with the fingers the bony outlet was enlarged to admit the hand, when the much-improved leverage enabled a surprising degree of further dilatation to be effected.

Dilatation of the cervix (started by invaginating it slightly) was completed by the usual digital method, but it was found that the approximation of the promontory and pubis would not allow the hand to pass into the uterus. The expedient which had proved so pleasingly successful at the outlet was applied at the brim, with an equally satisfactory result. With the hand in the pelvic cavity the girdle was levered out, until in a very short time the uterus was entered with comparative ease. Above the promontory the feet were grasped and, by pushing the trunk up from the brim (externally), delivered. The child was dying, and for speed of manipulation evisceration and thoracotomy were performed, and one clavicle was divided. With *vis a tergo* and *a fronte* delivery was effected without great difficulty. There was a perineal tear of not major importance. The patient was kept in bed for twenty-one days, mainly on account of the chest condition and because a vomit during the induction of anaesthesia contained partly digested blood of undiagnosed origin.

Comment

In this case the whole of the pelvic cavity and passages were manually dilated, without notable trauma. By this expedient delivery was effected, and the death of the patient avoided when no other means were possible. The amount of power required was not excessive, and was always under control. The strength of the particular hand is within average male limits.

I consider that the mechanics of this particular labour had aggravated the existing contraction, the brim being tilted downwards by the pressure on it of the foetal sacrum, and the maternal ischial rami and sacrum being approximated by the pull of the lower uterine attachments, in the complete absence of any dilating body within the pelvis. The remodelling of the passages, which was achieved so comparatively simply, consisted probably in the first place of the correction of this displacement; and, secondly, of a further stretching of the ligaments of the pelvic joints. Had the mechanism been normal from the outset this stretching would to some extent at least have occurred spontaneously, but one does not ordinarily approach the question of contracted passages from this standpoint. Out of a fairly comprehensive "kit" the only instrument used was a pair of scissors.

Lochmaddy, North Uist. Alex J. Macleod, M.B., Ch.B.

Large Aneurysm of the Circle of Willis with Spontaneous Cure by Thrombosis

Aneurysm of the circle of Willis, although now a well-known cause of subarachnoid haemorrhage, is a comparatively rare condition, but it is highly probable that small aneurysms causing no symptoms would be more frequently found if search were made for them at every necropsy. Such aneurysms are known to be in most cases congenital or atherosclerotic in origin. Spontaneous cure of such aneurysms, and especially of one as large as that about to be described, must be very rare indeed and worth recording.

A man aged 65 was admitted to the Glasgow Royal Infirmary after having been knocked down by a tramcar. On admission he was unconscious and was bleeding from the nose. He died six days later without regaining consciousness.

Post-mortem Report

The body was that of an elderly man. Only one eye was present, the left eye having been enucleated long before. The thoracic organs showed nothing of note except oedema of both lungs with an early hypostatic pneumonia. The abdominal organs were normal. On opening the skull a fracture was found on the left side of the vault running through the lateral part of the frontal bone across the squamous temporal and finishing on the occipital near the protuberance.

Laceration of the brain at the tips of the temporo-sphenoidal and frontal lobes was present, being most marked on the left temporo-sphenoidal and right frontal lobes. A hard mass the size of a small tangerine orange was felt in the right temporo-sphenoidal lobe. It was covered by brain tissue on all sides, but was attached in front to the right middle cerebral artery about the middle of its course across the sulcus between the temporal and frontal lobes. Dissection showed it to be an aneurysm of the middle cerebral artery communicating with the vessel by an opening about 2 mm. in size. The blood in the sac was completely clotted up to its mouth, and in parts contained calcareous deposit.

Microscopical examination of the sac near its mouth with the associated area of the middle cerebral artery revealed disappearance of the normal structure of the artery at the mouth of the sac, and its replacement by a thick fibrous wall which formed the wall of the sac throughout. There were no atheromatous patches on the circle of Willis or its larger branches.

In this interesting case spontaneous cure of a very serious condition had taken place. This seems most remarkable from the great size of the sac. The absence of atheroma elsewhere suggests that the aneurysm was of the congenital type. Only a very cursory past history was obtained, but in it there was nothing to suggest general or local pressure effects on the brain.

An interesting medico-legal point might be raised in this case. The patient had only his right eye. The situation and size of the aneurysmal sac was such that the optic radiation on that side must surely have been pressed upon and atrophied. The only optic fibres left then must have been those from the nasal half of the right retina, so that the patient had been blind in all his fields except the right temporal one, and it is thus not surprising that he failed to see the tramcar while crossing the road.

Alexander Lyall, M.B., Ch.B.,
Extra-dispensary Surgeon and Assistant Pathologist to the University at the Royal Infirmary, Glasgow.

Reviews

JOHN WHITRIDGE WILLIAMS

An address to the Pacific Coast Society of Obstetrics and Gynaecology in November, 1935, gave Dr. MORRIS SLEMONS the opportunity to deliver an appreciation of one of America's most distinguished and best-beloved obstetricians, which has now appeared in book form.[1] Dr. Slemons's sympathetic exposition of the character and the work of John Whitridge Williams will be very welcome to English readers, particularly to those who had the privilege of his friendship.

Born of a Virginia father and a New England mother, his family had never failed to produce at least one physician on either side in each generation for the last 160 years. In the words of his biographer, "he gave everywhere the impression of a thoroughbred," an impression heightened by his six feet of erect and well-proportioned manhood. The quality of personal dignity, invaluable in a teacher of undergraduates, he possessed in liberal measure, and to this he added a warm and sympathetic kindliness which won the hearts of his students.

Whitridge Williams's great work as a teacher was the foundation of the school of midwifery of Johns Hopkins Hospital in his home town of Baltimore. He began his work there at the age of 23 as a voluntary assistant to Professor Howard Kelly, who held the chair of gynaecology. He had previously become a doctor of medicine at 22, and had spent the following year in Berlin and Vienna. When Williams joined Professor Kelly, Johns Hopkins Hospital had no obstetric department, but it was not long before a start was made—not an auspicious start, for an isolation ward was divided by erecting a partition, and one half was relegated to midwifery while the other continued to serve its original purpose. Upon this unpromising foundation Whitridge Williams, during the succeeding forty years of active work, built up a school of obstetrics second to none in the United States.

Pathology was a subject which always attracted him, and it is interesting to recall the part he played in the settlement of the problem of the nature of the new growth which was first described in the early 'nineties as "deciduoma malignum." For long the question was debated whether this growth arose in decidual or in chorionic elements, and to Marchand is attributed the credit of demonstrating its origin from both layers of the chorionic epiblast. Almost simultaneously with Marchand's publication, however, there appeared in 1895 a monograph by Whitridge Williams in which the same view was advanced, a view which had been reached by independent observation. In 1900 he published the results of the examination of a consecutive series of 500 placentas, and his observations did much to elucidate the nature of the "white infarct." The last extensive piece of original work which he undertook was the study of the regeneration of the uterine mucosa after pregnancy, and he was fortunate in obtaining for this purpose a series of uteri removed by hysterectomy for various reasons from the first day of the puerperium up to the end of the sixth week. This monograph, which was perhaps his most important contribution, was not published until after his death.

As a clinician Whitridge Williams was a patient investigator and observer. The story told by Dr. Slemons of his work in connexion with the "funnel" pelvis is of deep interest, for the correct conclusions finally arrived at were only reached after the lessons taught by early mistakes had been pondered and assimilated. Finally, mention must be made of his *Textbook of Obstetrics*; first published in 1903, it had reached its sixth edition in 1930. It was admittedly the best book of its class in the English tongue, and its high reputation was maintained throughout in the face of particularly keen competition.

T. WATTS EDEN.

[1] *John Whitridge Williams. Academic Aspects and Bibliography.* By J. Morris Slemons. Baltimore: Johns Hopkins Press; London: H. Milford, Oxford University Press. (Pp. 109. 7s. net.)

THE PSYCHOLOGY OF CHILDREN

Of recent years there has been a growing appreciation of the difficulties that may beset the child in its mental and emotional development, and by the formation of child-guidance clinics an attempt has been, and is being, made to provide psychological help for the difficult or the maladjusted boy or girl. There can be little doubt that the seeds of future mental ill-health, of neurosis, are sown in the early years of life, when the foundations of character are being laid and emotional attitudes determined towards objects in the outside world, prominent among which are the mother and the father. *On the Bringing Up of Children*,[2] edited by Dr. JOHN RICKMAN, sets forth the views of five psycho-analysts on this problem, being the publication in book form of lectures delivered a year ago under the general title of "Can Upbringing be Planned?" In his admirable preface Dr. Rickman makes a number of helpful generalizations, which the reader of the book would do well to keep in mind:

> "The really important factor in upbringing is the *general attitude* of the parents, and the way in which the *ordinary* details of life are conducted. . . . The capacity to make good contact with other people and retain an easy relation with them is more important than the capacity to imitate their behaviour; in no case is this good contact of more importance than in the relation between parent and child."

The first chapter is by Miss E. M. Sharpe on "planning for stability." In this she wisely lays stress upon the emotional environment formed by the parents. "Where the parents have a stabilized happy relationship there is an explicit pattern which will be interwoven in the child's psychic life, and whatever the child's psychic problems may be, this at least will be a factor ever making for normality." Mrs. Melanie Klein's advice in the chapter on weaning, that "other oral gratifications, such as sweets, fruits, and specially flavoured foods," should be provided *ad libitum* to soften the process of weaning, may possibly be sound psychology but it is certainly not sound dietetics. In the third chapter, on the uses of sensuality, Dr. Middlemore points out that the parent who demands demonstrations of affection from the child runs the risk of creating in the latter "a sense of obligation which should have no place either in the love that is natural in childhood or in adult life." Miss Searl, in the chapter "Question and Answer," rightly deplores the attempt of the parent who knows a little about psycho-analysis to try to ferret out "complexes." She makes a useful distinction between curiosity and interest, and stresses the importance of the motive behind the question. Dr. Susan Isaacs contributes a valuable chapter on "Habit," illustrating with short case-histories the problems that may arise when an over-anxious mother tries to force the pace for her child in the development of sphincter control. In the last chapter she discusses the problems of love and hate which the growing child has to face.

We can warmly recommend this book to those who want to know what is the contribution psycho-analysis

[2] *On the Bringing Up of Children.* By Five Psycho-Analysts. Edited by John Rickman. London: Kegan Paul and Co. Ltd. 1936. (Pp. 237. 6s. net.)

claims to make to the upbringing of children, a claim which Dr. Rickman describes thus: "The discoveries of psycho-analysis have not, of course, supplanted the sound work and clear observation already made in education and child welfare, but have given their application greater definition and exactness."

DENTAL PATHOLOGY

Pathologie Dentaire[3] is the second of a series designed to cover the whole range of stomatological practice, under the editorship of Dr. CHOMPRET. As announced on the appearance of the first volume, each chapter is written by a specialist in the subject under review. The authors of this volume are Drs. BERCHER, FARGIN-FAYOLLE, FLEURY, and LACAISSE. Between them they treat of dental caries; pyorrhoea; injuries, anomalies, hypoplasias of teeth; teething; odontomes; tumours; and diseases of the maxillary sinus. We think less prominence would have been given to the possible internal origin of caries had Fish's recent demonstration of the impermeability of secondary dentine been fully realized. In discussing pyorrhoea, which they not inaptly name *polyalveolysis*, the authors recall the work of Fauchard, who in 1746 described it under the title of *scorbut des gencives*. In discussing hypoplasias hereditary syphilis is suggested as a cause of actual suppression of one or more of the permanent teeth.

Tumours are classified as inflammatory and hyperplastic tumours, benign dysembryoplasias, and malignant dysembryoplasias. The general style of the book is logical, almost too much so, as witness the line of argument by which demineralization of the teeth in the course of tuberculosis is accepted as a fact. We doubt also whether "pulp-stones" are ever a cause of pain, not to mention severe neuralgia. There is a commendable tendency to simplify the bacteriology of the mouth, but *Bacterium termo* reads archaic to us. The present volume sustains the promise of the first, and should be read by all who want the best French opinions on the subjects treated.

PULMONARY TUBERCULOSIS

In a book written by American authors primarily for American readers some national bias in references is inevitable. Moreover, a greater knowledge of medical detail is perhaps demanded of nurses in the United States than in England. These facts do not, however, detract from the value of *The Diagnosis and Treatment of Pulmonary Tuberculosis*,[4] described as "A Handbook for Practitioners, a Textbook for Students, Nurses, and Social Workers," an eminently readable little book, which we highly recommend to those for whom it is intended—even in this country. It is written in an attractive colloquial style, and throughout wide experience and common sense appear to have guided the authors in its compilation, essentials being brought out in an arresting manner. The chapter on history-taking is excellent, and will be read with profit even by experienced tuberculosis workers. A certain dogmatism is responsible for such statements as "any question of inherited disease or a tendency toward disease may be ruled out as far as tuberculosis is concerned," or "they [the authorities] all agree, however, that the child thus hypersensitized to tuberculosis if exposed to subsequent reinfection runs a far greater chance of becoming seriously sick than does the child who has escaped a primary infection." These statements represent perhaps American views which are not universally accepted, but they may be forgiven in a book that is essentially practical in its scope and contains such shrewd and courageous advice as: "if a friend or relative is present at this interview [history-taking] get him to give his viewpoint and opinion on this subject. This, if it does nothing else, will often produce a controversy [with the patient] out of which truth may appear"; or again: "we are of the opinion that in the average case [of haemoptysis] this [morphine] does more harm than good and that the same drug given to members of the family would accomplish more than when given to the patient." The authors' handling of controversial points may be illustrated by quoting their comment on sanocrysin: "we do not recommend its use at present, but owing to some excellent reports concerning it, and especially due to the enthusiasm of some French workers, we urge an open mind in regard to it." Finally, it should be added that not the least important features of this book are the succinct summaries and well-chosen suggestions for supplementary reading given at the end of each chapter.

STORIES OF THE CORONER'S COURT

There is a vivid contrast between the dry, formal, somewhat squalid atmosphere of a London coroner's court and the stories of primitive emotion and often of horrible tragedy which are related there. Dr. H. R. OSWALD, who was a London coroner from 1894 until a short time ago, spins a yarn[5] which is a good deal more interesting than most of the works of sensational fiction published nowadays. In the course of his career he held over 3,000 inquests, and a reasonably high proportion of these had some striking and unusual feature. On almost every page there is an intimate reminiscence of some *cause célèbre* that will not be forgotten for many years to come. One of his early adventures was the Woolwich Arsenal explosion in 1903, when the "danger buildings" on Plumstead Marshes were blown to pieces and sixteen workmen killed. In 1905 he inquired into the murder of an old shopkeeper in Deptford by a couple of young fiends called Stratton, probably the first murder case in which finger-print evidence was given. He recalls the case of a man who was killed by a stag in Greenwich Park, early "road-hog" deaths, and—a very interesting section of the book—the war years with the inquests on victims of air raids. He gives a dramatic account of the "silent raid" of 1917, when one Zeppelin out of eleven reached London about three hours late—the squadron having lost its way—and found the country under darkness and complete silence. The airship dropped a torpedo which fell in Piccadilly Circus and caused fearful damage, and another which blew half a street down in South London.

> "Children were crying piteously, terribly mutilated victims were screaming, the night was made day by ambulance headlights and flares, firemen and police worked the night through, doctors performed operations on the spot. Far overhead, silent and dark and massive, floated the solitary airship that had done the damage with a single missile. The workers on the ground expected another bomb every moment, but none came."

Dr. Oswald's remarks on the two parallel cases of Ronald True and Jacobi, which caused so much controversy and gave rise to accusations against the authorities of favouring a son of distinguished parents and condemning an obscure offender, throw light on that dispute. Perhaps the "high spot" of the book is the author's

[3] *La Pratique Stomatologique. II, Pathologie Dentaire.* By Drs. Bercher, Fargin-Fayolle, Fleury, and Lacaisse. Paris: Masson et Cie. 1935. (Pp. 562; 289 figures. Broché, 70 fr.; cartonné toile, 85 fr.)

[4] *The Diagnosis and Treatment of Pulmonary Tuberculosis.* A Handbook for Practitioners, a Textbook for Students, Nurses, and Social Workers. By John B. Hawes, M.D., and Moses J. Stone, M.D. London: Henry Kimpton. 1936. (Pp. 216; 43 figures. 12s. 6d. net.)

[5] *Memoirs of a London County Coroner.* By H. R. Oswald, M.D., C.M., Barrister-at-Law. London: Stanley Paul and Co., Ltd. 1936. (Pp. 288; 21 illustrations. 18s.)

account of the Westminster flood disaster, when dozens of basements were suddenly filled with icy Thames water in the middle of the night and the inmates drowned. He narrates one of the most amazing rescues in literature: a girl, who with several other people was trapped in a basement room, broke her way out of the window and escaped to the surface, which was at street level. She instantly dived again and rescued in turn three members of her family, nearly losing her own life. Besides being half drowned she was badly cut by broken glass. How she managed in the pitch darkness of the flooded room to find either the victims or her way out will remain a mystery.

Not less interesting than these anecdotes are the sidelights Dr. Oswald gives on his own outlook. He represents almost perfectly the Victorian attitude: he is devoted to his duty, which is the service of the community; he subscribes completely to—in fact is practically identified with—the ideals and conventions of the Victorian Age. It is a profound mistake to undervalue these ideals and conventions; they are the tough fibre of the minds which achieved so much and laid such firm foundations of civic stability. These qualities have their defects, which perhaps explain why the Departmental Committee on Coroners was convened. It may be that the function and practice of the coroner will be more or less radically altered in the near future. Should this happen it will be a thousand pities if the good, plain virtues of the coroner, as represented by Dr. Oswald and his contemporaries, are denied their full scope.

Notes on Books

Mr. Havelock Ellis's epoch-making and pioneer *Studies in the Psychology of Sex*[6] have recently been republished in four volumes in place of the previous seven-volume edition. The present issue contains a foreword by Dr. Morris L. Ernst of New York, who truly says that these studies constitute not only an incredibly rich mine for the physician, psychologist, psychiatrist, criminologist, and educationist, but are equally important to the general public. Mr. Havelock Ellis himself, whose portrait is prefixed to the first volume, has also added a foreword in which he reviews the history of his work. In addition to an index for each volume, a cumulative index for the whole is appended to the final volume.

The proceedings of the Congress on Gout and Uric Acid, which was held at Vittel last September, have now been published in a volume of more than 650 pages. The contents are grouped in five sections, to bring together respectively the contributions relating to the clinical, biological, hydrological, therapeutic, and experimental standpoints. In this way a broad outlook of the whole subject is conveniently arranged for study, and the various advances in knowledge are clearly indicated. The clinical side received special attention, but the pathological and therapeutic aspects came little short as regards the number of addresses, and the practical value of the whole volume is therefore great. The delegates came from all over the world, and various lines of thought and practice are therefore represented in its pages. The volume is published in French, and may be obtained free on application to the Société Générale des Eaux Minérales, Vittel, Vosges, France.

A third edition of the *Manual of Emergencies, Medical, Surgical, and Obstetric*,[7] by Dr. J. Snowman, has recently been published. This new edition has undergone complete revision, and the most recent modification in the prevalent views on pathology, diagnosis, and treatment have been embodied. The work was originally based upon Lenzmann's treatise, and his scheme has been adhered to, but very little of the original remains in the endeavour to present in this manual an outline of the modern teaching of the standard British authorities on medical, surgical, and obstetric emergencies. In the case of each emergency discussed the pathological mechanism is explained, followed by the diagnosis and treatment. The descriptions are graphic, and the advice given is clear and reflects up-to-date opinion. It is a great advantage to have such a summary concentrated in one volume. The book is of a size which makes it easy to carry in the pocket or in the practitioner's bag.

The twenty-first edition of Heath's famous *Minor Surgery* has made its appearance under the editorship of Mr. Gwynne Williams. The title has been altered to *Minor Surgery and the Treatment of Fractures*[8]; the substitution of fractures for bandaging in the title is a recognition of the fact that the art of bandaging has declined to the minor position which it really deserves, while a knowledge of the treatment of fractures is essential to every house-surgeon. It is not necessary to review such a book as this in detail. First published in 1861 it has long since been looked upon as an established classic. A pleasing feature of the new edition is a frontispiece portrait of Christopher Heath and a prefatory note in which the salient details of his career are enumerated. This tribute to a great teacher is most appropriate when the book which he fathered is still in vigorous health after seventy-five years.

In 162 pages Dr. Segerdahl gives a complete review of the history and the technique of the diagnosis of blood diseases by sternal puncture.[9] The external sternal corticalis being only 0.5 to 1 c.mm. thick, a canula can easily be pushed through it into the medullary cavity. Some of its content is then drawn up with a small syringe. In most cases enough material is thus obtained to make smears which are examined in the ordinary way. It seems, however, that this is where the real difficulties begin, and that the worker in this field would have to master not only blood histology but statistical mathematics as well. The whole subject is more important to the scientist than to the practitioner and, as a diagnostical method, this will probably for ever remain in the hands of the specializing haematologist.

Preparations and Appliances

BENZEDRINE

Benzedrine brand tablets (Menley and James Ltd., 64, Hatton Garden, E.C.1) are a preparation of a new synthetic drug, which has certain very interesting properties.

Benzedrine (β-phenylisopropylamine sulphate) was first studied by G. A. Alles in 1933. He showed that it was a fairly powerful sympathomimetic compound, with a prolonged action. The outstanding effects were a rise in blood pressure and a relaxation of plain muscle. Prinzmetal and Blomberg in 1935 tried the drug for narcolepsy, and found that it had a more powerful action than ephedrine and relieved several cases in which the latter drug had failed. Peoples and Guttmann have recently published an interesting account of observations made at the Maudsley Hospital. They found that the drug produced euphoria in normal persons and had a striking action in various forms of psychosis, since certain depressive cases became talkative and lively after its use.

These observations suggest a wide field of possible uses for the drug. It is a commonplace that the virtues and dangers of a new drug are never fully known until it has been in use for a considerable time. In this case there is an obvious possibility of drug addiction being encountered, and it is certainly a drug which should be given only under careful supervision until its properties are fully known. The vendors supply a brochure, which gives a good summary of present knowledge.

[6] *Studies in the Psychology of Sex.* By Havelock Ellis. London: John Lane, The Bodley Head; New York: F. A. Davis Company. 1936. (4 vols., £4 4s.)

[7] *Manual of Emergencies, Medical, Surgical, and Obstetric. Their Pathology, Diagnosis, and Treatment.* By J. Snowman, M.D., M.R.C.P. Third edition. London: J. Bale, Sons and Danielsson, Ltd. 1936. (Pp. 401. 10s. 6d. post free.)

[8] *Minor Surgery and the Treatment of Fractures (Heath, Pollard, Davies).* Edited by Gwynne Williams, M.S., F.R.C.S. Twenty-first edition. London: J. and A. Churchill, Ltd. 1936. (Pp. 485; 284 figures. 10s. 6d.)

[9] *Uber Sternal-Punktionen.* By Elsa Segerdahl. *Acta Medica Scandinavica*, Supplementum lxiv. Upsala: Appelbergs Boktryckeriaktiebolag. 1935.

British Medical Journal

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COLLAPSE THERAPY

The progress made in medical science during the last fifty years has not witnessed the discovery of a cure for pulmonary tuberculosis. To the general observer, conscious of the increasing knowledge of the disease, this is a matter for surprise ; to the clinical worker, confronted with numerous more or less advanced cases of phthisis, one of daily disappointment. Although the empirical drug treatment of the last century gave way to the sanatorium principle of fresh air, diet, and graduated exercise, the false belief in its specificity soon led to disappointment ; and when phthisis was recognized as a self-limiting disease, tending to spontaneous cure, tuberculosis physicians, failing some specific method of treatment, resigned themselves to procuring for the patient conditions which would assist Nature in her work. Thus there emerged the principle of rest, whose value in its general form is perhaps not sufficiently recognized even now. General rest is, however, not enough: not only because of the time it must be continued to produce a permanent result, but because mechanical conditions in the chest may interfere with Nature's efforts when the latter involve the contraction of fibrous tissue. The next logical step was therefore to seek some means of obtaining " local rest " for the lung. Artificial pneumothorax provided the solution, and the major surgical procedures now practised were evolved on the same principle. Excellent results have been obtained ; but at their side so many failures are seen that the unprejudiced onlooker is asking himself whether these contradictory results are due to individual faulty application of the methods or to erroneous or inadequate knowledge of the basic principles in general (see leading article in the *Journal* of June 27th, p. 1305).

The two papers we publish to-day by Dr. J. Gravesen and Dr. G. T. Hebert, together admirably present the correct principles of collapse therapy ; but, in regard to artificial pneumothorax, they show a certain contradiction which it is imperative to examine. Although Gravesen admits that " artificial pneumothorax can be induced or attempted without any serious influence on the reserve power of immunity, and should not be postponed until adhesions have formed," he holds that " collapse therapy [in which term he presumably includes artificial pneumothorax] has one aim: to make the closure of cavities possible by relaxing the tension of the lung." Hebert, whose views accord closely with those of the French and Italian schools and of many American workers, clearly believes that artificial pneumothorax is a suitable method of treating a tuberculous lung lesion even when there is no cavitation, and that it may in fact be contra-indicated in some types of cavities. This divergence in views is perhaps more apparent than real. A tuberculous lesion in the lung is at a mechanical disadvantage from two aspects: the traumatism to which it is subjected as a result of the distended organ even in expiration, and the hindrance to contraction of the fibrous tissue formed in healing. An artificial pneumothorax for an exudative lesion eliminates or reduces the former factor ; and when it produces a selective collapse, as generally occurs with an early lesion, necessitates the giving of little air, and does not interfere with the patient's general resistance. The reduction in toxaemia, assisted by the venous and lymphatic stasis produced, has in fact the opposite effect—it tends to raise the resistance. It is not necessary that the lesion should show demarcation, that is, be delimited by a zone of fibrous tissue, a reaction indicating cessation of local spread of the lesion. As Hebert points out, since the effect of compression is minimal, an artificial pneumothorax may be entirely ineffective in productive lesions, especially when thick-walled cavities are present. Thoracoplasty and apicolysis, on the other hand, give relaxation by allowing the fibrous tissue present to contract, compression probably also helping. Such an explanation of their action and the disturbance to the patient they involve make it essential, as Gravesen emphasizes, to resort to these measures only when there is demarcation of the lesion and when the resistance of the patient is at a high level.

The exposition of the broad principles in these two papers is comprehensive, but the remarks of Gravesen must be looked upon as applicable to the major surgical procedures alone, and those of Hebert to artificial pneumothorax alone. Hebert's paper, based on a thorough clinical approach, should help to do away with the empiricism still observed in the application of the method. Some might find fault with his method of assessing the duration of treatment ; but he offers it only tentatively. Even so, it gives a logical alternative to the present almost haphazard routine adopted by various workers. Gravesen's principles find full justification in the figures he submits from Vejlefjord Sanatorium. Two points must be stressed: the advisability of limiting the extent of the operation to the minimum required (for which accurate localization of the lesion is essential), and the need for viewing mechanical relaxation not only from the side to the mediastinum, but also from above downwards. In other words, while in artificial pneumothorax the selective collapse is obtained by the spontaneous retraction of the pathological tissue, in thoracoplasty and apicolysis selective relaxation will only be achieved by adapting the form and extent of the operation to the type and situation of the lesion. Gravesen's almost absolute condemnation of phrenic interruption will, however, meet with criticism. His views are perhaps due to confusion between the principles of artificial pneumothorax therapy and those of major surgery, and to the lack of distinction between the permanent and the temporary operation.

In a basal lesion phrenic interruption may be beneficial in both the exudative and the productive forms ; for the former the operation should be a temporary one, for the latter permanent. Many workers claim benefit in apical lesions ; and this is probably due to the general reduction in lung volume which follows the operation, an effect more likely to be met when there are no or few adhesions, and generally agreed to be transient. It may not be illogical, therefore, to suggest the performance of the temporary operation in early exudative lesions anywhere in the lung, in association with rest, when the induction of a pneumothorax does not appear to be justified. Collapse therapy for pulmonary tuberculosis has come to stay. Its increasing popularity makes it more and more desirable that it should be placed on a rational basis, and the two papers published in this issue should assist in attaining this object.

DIET AND THE TEETH

The Committee on Dental Disease appointed by the Medical Research Council has now published its final report on the influence of diet on caries in children's teeth.[1] The earlier reports gave the results of Mrs. Mellanby's well-known experiments on animals and observations on children regarding the influence of diet on teeth. The committee considered that observations should be carried out whose scale and duration were sufficient to provide a conclusive test of the validity of the theory that the nutritional condition of the body is a dominant factor in determining the structure of teeth and their resistance to decay, and that the supply of certain vitamins in early life is of particular importance in this respect. The tests described in this report were authorized by the Medical Research Council in 1926 ; they were begun in 1928 and a preliminary report appeared in 1931. The general scheme was to make certain additions to the diet of groups of children living under fairly uniform conditions and to determine whether these additions produced any demonstrable effect on the incidence of caries and on the condition of the teeth. Three researches were carried out. In the first investigation children in three institutions were given as a daily supplement either olive oil, treacle, or cod-liver oil. In the second investigation olive oil and vitamin D were compared. These children were of school age (average about 10 years), and the third similar investigation was made on infants between 2 and 5 years. The total population of the three institutions was about 1,000, and the total number of children dealt with was about 1,500, but the report only deals with those who were under continuous observation for at least 2½ years, and this number was about 170 in the first and 120 in the second investigation. This wastage of material was higher than had been anticipated because of the transfer of the institutions in 1930 from the Poor Law authority to the local education authority.

The value of an inquiry of this kind depends entirely on the care and impartiality with which the material compared is selected, and examination of the report indicates that the investigators took the greatest pains to obtain as uniform conditions as possible for their different groups ; they appear, moreover, to have discarded ruthlessly all material to which any exception could be taken. The results of the investigation can only be fully appreciated by detailed study of the data set out in the report. They can, however, be summarized roughly as follows. Addition of cod-liver oil or vitamin D to the basal diet reduced to one-half the incidence of caries in newly erupted teeth. These additions also had a smaller but definite protective effect on previously erupted permanent teeth and on deciduous teeth. The protective action was smallest in the case of deciduous teeth, but was demonstrable in all cases both in the children of school age and in the infants of 2 to 5 years. The investigators did not content themselves with a simple enumeration of the incidence of caries but made careful observations regarding the extent of the caries and the formation of the teeth. All these tests agreed in showing the beneficial effect of cod-liver oil and vitamin D. A point of outstanding importance is that the basal diet in these institutions was a satisfactory one—considerably better than the average diet in poor homes. The tests therefore compare the effect of a diet of average value as regards vitamin content with that of a diet containing a special addition of vitamins. This is a much more severe test than is the comparison of the effects of vitamin-rich and vitamin-poor diets.

This long and difficult inquiry has confirmed the previous work and provided a clear answer to the important question whether children's teeth can be protected by increasing the vitamin content of their diet. The importance of the problem of the prevention of caries is so obvious that it does not need to be stressed, and its extent is well illustrated by figures obtained in the controls. These children received a basal diet of adequate calorie value, which included a pint of milk, a rather high proportion of animal fats, and a calcium content of 1.2 grams per "man" per day. Nevertheless about 20 per cent. of the permanent teeth of these control children became carious in less than three years after eruption. The report gives many other interesting data concerning the influence of the supplementary rations on the general health, incidence of rickets, incidence of colds and chilblains, etc., and in general it constitutes a remarkable study of the influence of diet on the health of children.

Consideration of the report as a whole brings out one important general point in relation to research on the prevention of disease. There is universal agreement that the future of medicine lies in prevention rather than cure, but this report gives a clear warning of the difficulties attending any attempt to obtain data of scientific accuracy relating to the prevention of disease. The investigation lasted eight years, and required the services of a team of workers. It was only made possible by the willing co-operation of a variety of authorities, but even with this help the wastage of data was

[1] Medical Research Council. Special Report Series, No. 211. H.M. Stationery Office. 1936. (2s.)

enormous, and the work presented must be only a small fraction of the work actually done. It is evident that research on the prevention of disease will involve work planned on a scale to which hitherto we have been unaccustomed. The subject of the present investigation was indeed exceptionally favourable because the normal incidence of dental caries is so high, and the study of means of prevention of other less prevalent conditions is likely to require longer periods and larger populations. The members of the Committee on Dental Disease (who in this matter had the assistance of Alan Deverall and Mabel Reynolds) are to be congratulated not only because they have found a definite answer to a question of outstanding importance for national health, but also because they have provided an example of the manner in which problems of preventive medicine can be investigated.

TREATMENT OF VENEREAL DISEASE

Venereal diseases are of such great importance and cause so much invalidity in the Army that the appearance of *Memoranda on Venereal Diseases*[1] compiled by Lieut.-Colonel H. G. Winter, R.A.M.C., is particularly to be welcomed: the more so since these notes are admirably put together ; are, in general, in accord with orthodox modern teaching ; and contain all the information on venereal diseases which an officer of the R.A.M.C.—other than a specialist—need possess. Chapter I, on the organization of a venereal division, will not appeal to the civilian ; he need not even read it ; but it is very necessary for officers and N.C.O.s who have charge of cases of venereal disease. It should be remembered that in the Army it is imperative to admit to hospital all cases so long as they are in any way contagious, a procedure which is neither necessary nor practicable in civil life. The anatomy, physiology, pathology, and treatment of gonorrhoea are very clearly and succinctly described, and the careful reader should be able to deal adequately with any but the most unusual cases. Some would disagree with the statement that " proctitis is comparatively rare " ; recent investigations have shown that it is much commoner than many people suppose, though often symptomless, and the author admits that it is commoner in women than in men. Nor is it generally agreed that mercury oxycyanide in a strength of 1 in 8,000 if continued for more than two days is likely to set up a chemical urethritis unless the patient is taking potassium iodide. A warning to this effect should be included, since concomitant syphilis and gonorrhoea are not very uncommon. Irrigation right through into the bladder from the first is recommended in acute gonorrhoea, and, wisely, no strong opinions are expressed as to the value of vaccines ; on the whole they are favoured, especially the " exotoxin " of Dimond and Lambkin, though the purist would prefer the latter to be given " intracutaneously " rather than " intradermally," a hybrid word. A little more stress might be laid on the value of diathermy in treatment, though perhaps the subject is rather outside the scope of a small work. The notes on syphilis are equally good, particularly those referring to complications and reactions to remedies and their treatment. The treatment of syphilis in the Army has, it is well known, been efficient for many years, more particularly since the introduction of salvarsan, when Army officers led medical opinion on the subject in this country ; but the treatment of early primary syphilis as described in these memoranda falls far short of that recommended recently by the American Co-operative Clinical Group and by the experts of the League of Nations Health Organization. These lay down that cases of primary syphilis should receive approximately as much treatment as secondary cases, and recommend more than double the weight of arsphenamine and bismuth suggested by Colonel Winter, and also much shorter intervals between courses of injections. Trichomonas vaginitis is not mentioned and very little space is allotted to lymphogranuloma inguinale. It might have been expected that the latter would be of importance in the Army, seeing that British troops serve in so many parts of the world. Errors of spelling are far too numerous—such as antro for antero, stranguary for strangury, verummontanum, scrapping for scraping, Gorgi for Georgi, ilium for ileum, bacillae, and spirillae. These are, perhaps, venial slips and do little to detract from a really valuable guide, which should be as useful to the general practitioner as to the officer of the R.A.M.C., neither of whom should neglect to consult it when occasion arises.

[1] H.M. Stationery Office. 1936. (3s. 6d. net.)

INDUSTRIAL HEALTH RESEARCH

The sixteenth annual report of the Industrial Health Research Board[1] maintains the interest of its predecessors. In its introduction it points out that though advancing knowledge may enable us to lay down the best conditions of work and the best methods for selecting employees, it is with the supervisory staff that the last word rests in the maintenance of health and contentment. The modern manager of a labour force can no longer be a dictator or afford to be tactless. He does not need employees with well-developed muscle so much as alert, smart, and active men ; but these, though more adaptable to the needs of modern industry, are often more aggressive, quicker to make trouble and to demand their rights, and—more liable to forget their duties. The Board is convinced that industrial managements generally welcome the betterment of working conditions more for their effect on the health, comfort, and happiness of the employees than for the increase of output which good health induces. The chief of the problems before the Board is that of industrial misfits. This problem affects especially those at the top and those at the bottom ; the former because unsuitable people in authority can do so much harm, the latter because there is still time to direct their capacities into other channels. Several reports have lately been published by the Board on the psychological conditions of work, and another has just been completed on the nature, causes, and prevalence of boredom and discontent among operatives employed on simple types of repetition work. Among the factors investigated were the possibilities of gramophone music and changes in the type of work as antidotes to bore-

[1] Medical Research Council. Sixteenth Annual Report of the Industrial Health Research Board. London: H.M. Stationery Office. 1936. (9d. net.)

dom. The provision of effective incentives is being investigated, the most potent probably being a higher weekly wage, though other factors such as the opportunities for self-advancement, visible records of progress, and the encouragement of group loyalty have also to be considered. Recent inquiries by the Board's investigators on problems of health include a lengthy investigation on sickness absenteeism, and an examination of the belief that transport workers, more especially bus drivers, are specially liable to gastric complaints. The subject of accidents can never be neglected, and two investigators are now collecting information on the road accidents incurred by the drivers of public transport companies and by private motorists in relation to the factor of accident-proneness. Other investigations are being made on the influence of this factor upon the accident liability of skilled and unskilled industrial workers. The physical conditions under which industry is carried on have been the subject of several inquiries. The effects of lighting on the output and loom stoppages of weavers have been determined, while the effects of noise are now being investigated among operatives employed on braiding machines, which produce a penetrating high-pitched noise. Heating and ventilation have been investigated at a dozen factories with a view to determining the conditions of maximum warmth comfort among the employees and the best instruments for measuring them.

TREATMENT OF PINK DISEASE

In the opening paper read by Dr. A. J. Wood and Dr. I. Wood at the Australian meeting of the British Medical Association and published in this *Journal*[1] it was suggested that pink disease was self-limited and that many of the so-called cures were due to a natural tendency to recover in the course of time. Since the cause of the disease is still a mystery it is obvious that treatment cannot be undertaken in a scientific manner. On one aspect of treatment all authorities are agreed, and that is the inadvisability of admitting children with pink disease into hospital. Braithwaite in this country[2] believes that sunlight does harm, but in a recent article[3] G. Bruton Sweet restates a case for the use of ultra-violet light. It was more than ten years ago that this author first began to use the mercury vapour lamp in the treatment of pink disease, and he now claims that only a few weeks' treatment is necessary and that nothing else need be done. The patient is entirely undressed and is placed, lying on a cotton towel, on a high couch without any pillow. He is thoroughly warmed with a carbon filament (radiant heat) lamp suspended above him at a distance of eighteen inches from the body. If such a lamp is not available an electric radiator on a table about eighteen inches above and to the side of the patient may be used. When the heat lamp is switched on the mercury vapour lamp is lighted and the visor closed for five minutes, so that the lamp gets thoroughly warmed up. The distance between the quartz tube and the patient is carefully measured. All patients are treated twice a week. Smoked-glass goggles must be worn by doctor and nurse, and the patient's eyes must be protected against the ultra-violet rays by a thin pad of gauze. The patient must be turned from the recumbent to the prone position and back again at least every minute. The time of exposure employed will depend on the length of time the quartz burner has been used. If erythema occurs and is visible at the treatment following that by which it was produced, the affected part should be covered with gauze during exposure to the lamp and the time of exposure reduced. The radiant heat is continued during treatment with the mercury vapour lamp and for five to fifteen minutes afterwards. Sweet is insistent that a patient with pink disease must not be admitted to hospital, but should be kept in his cot at home in a cool, well-ventilated room or on a shady veranda. He should be bathed twice daily in tepid water, and, after drying, the skin may be dusted with a powder composed of boric acid one part, zinc oxide two parts, and powdered starch three parts. The clothing should be as light as possible and silk or cotton underclothing should be worn next to the skin. Food of a nature suitable for the age should be given, but no attempt made to force the patient to take more than his appetite demands. The only internal medicines found necessary are a mild aperient for constipation and a suitable mixture for diarrhoea if this occurs during the summer months. Braithwaite claims that he cures his patients by excluding from their living rooms the ultra-violet rays present in sunlight by means of red windows. Bruton Sweet claims that he cures all his patients by the mercury vapour lamp, which is rich in these rays. Both authors produce impressive lists of cases, and, clearly, further work by some independent authority is needed to settle the question at issue.

[1] *British Medical Journal*, 1935, ii, 527.
[2] *Arch. Dis. in Childh.*, 1936, xi, 49.
[3] *Med. Journ. of Australia*, March 28th, 1936, p. 430.

CHRONIC ULCER OF THE LEG

Among the visitors to practitioners' surgeries and the out-patient departments of hospitals old women and (rather less often) old men with chronic ulcers of the legs continue to be conspicuous by their numbers and their frequent attendances. The probability is that if most of these patients could be put to bed and kept there for some months their ulcers would heal, but through lack either of means or of inclination this is not often effected and other measures have to be adopted. Some few years ago Leriche and those who were inspired with his enthusiasm attempted to cure these ulcers by increasing local circulation in relation to them by operations on the sympathetic system, particularly the periarterial operation, but we now know that the results of periarterial sympathectomy are transient, and, although improvement in or healing of these leg ulcers frequently follows it, relapse occurs later. Sympathectomy is rarely indicated ; in fact operations of any kind are not often required, and, should they be, skin grafting is the chief radical measure to be considered. We owe much to Dickson Wright in this country and to Beverly Douglas[1 2] in America for the knowledge of practical ambulatory methods of treating these ulcers so that they heal with little or no inconvenience to patient or practitioner. Contraction is one of the most important factors in the healing of an ulcer, and it is retarded or prevented in many chronic ulcers of the leg by the

[1] *Surg., Gynecol. and Obstet.*, 1935, lxi, 458.
[2] *Arch. of Surg.*, 1936, xxxii, 756.

presence of oedema and excessive scar tissue. Measures that tend to induce contraction promote healing, and one of the most practical is the elastic adhesive bandage. Both Dickson Wright and Beverly Douglas have been ardent advocates of the use of elastic adhesive bandages in these cases, and this conservative treatment has everything to recommend it, being both easily applied and eminently effective. The elastic adhesive bandage, of which there are several patterns on the market, combines the desirable supporting properties of the old Unna's paste boot, the elastic stocking, gutta-percha tissue, and ordinary adhesive strapping, without their disadvantages. It is of course obvious that before treatment with the elastic adhesive underlying causes of the ulceration should be dealt with, varicose veins thrombosed or removed, anaemia corrected, sequestra removed in cases of osteomyelitis, lues treated, and the general health of the patient attended to. In order to obtain the best results it is necessary to follow certain details in applying the elastic adhesive strapping. The skin should be shaved and cleaned with spirit, excess secretions removed, the leg elevated, and the bandage firmly applied from below upwards, beginning as a spica round the ankle. The mistake is usually made of not applying the bandage with sufficient firmness to cut off the stagnant venous circulation. To maintain firm pressure where there is much swelling of the leg the bandage should be changed for a tighter one at the end of four or five days. Soap and water may be used to wash secretion off the outside of the bandage, which is changed only every two or three weeks, the best results being obtained by infrequent changes. Though this treatment is well known to many it is as well to emphasize its value, as there are still many sufferers whose ulcers could be healed.

MEDICINE IN THE BIBLE

It is common knowledge that the sanitary code outlined in the Pentateuch is far in advance of any code established in Europe before the nineteenth century. The English renderings of the Bible do not, however, do full justice to the value of the code as a work of medical science, for although the scholars who made the Authorized Version rendered a unique service to the English language by the beauty of their work, yet their medical knowledge and interest was not great, and the detailed accuracy of the health regulations with which they dealt has suffered by translation into the familiar sonorous prose. The sacred books of the Jews have been subjected to thorough examination by succeeding generations of scholars and commentators, and Dr. Charles Brim of the Beth Israel Hospital of New York has followed this tradition by producing an interesting work[1] in which the merits of the Pentateuch as a sanitary code are examined closely. The author bases his interpretations upon the Hebrew text of the Torah and upon the Jewish commentators, particularly upon the work of Rashi, the "commentator" who lived in the eleventh century. The Jewish knowledge of anatomy and surgery is shown to have been considerable, but chief attention is devoted to the regulations dealing with diagnosis of infectious disease, disinfection, and quarantine. Dr. Brim shows that there was a fairly complete system of sanitary law enforced by the priests, who acted as medical officers of health and sanitary inspectors. He makes a very effective point by tabulating a large number of quarantine regulations under the title of "Health Bulletins" issued under orders of the Mosaic Health Board. The essential wisdom of the regulations governing dietetics and sexual relations is also emphasized. The combination of medical knowledge with an exhaustive knowledge of Hebrew literature has resulted in a very interesting book that reveals a wide variety of points of which the English translators of the Bible give slight or no indication. The author does not deal with the results of the higher criticism, and hence does not discuss the stages of medical knowledge attained in the various original sources of the Pentateuch. It is his intention to continue his work with further studies of the medicine of the Prophets and of the Writings.

[1] *Medicine in the Bible. The Pentateuch Torah.* By Charles J. Brim, M.D. New York: Froben Press. (5 dollars, post paid.)

LESTER INSTITUTE, SHANGHAI

The annual report for 1935 of the Henry Lester Institute of Medical Research, Shanghai, includes many interesting items. In the Clinical Division Dr. Platt has carried out researches on vitamin B_1 with reference to beri-beri. In the Division of Physiological Sciences Chinese factory diets have been investigated as part of a general diet survey with a view to elucidating the nutritional factor in disease. With regard to vitamin content, food analyses demonstrate that normal Chinese dietary, when not interfered with by modern civilization, is adequate in this respect. In field medical research special attention has been paid to entomology and parasitology. The surrounding country offers excellent facilities, for rice-field irrigation favours mosquito breeding, while intensive fertilization of the soil by human and animal excreta maintains the vicious circle of many helminthic diseases. Mosquito research has been carried out by breeding the insects in special "insectaries" in their natural environment. In the Division of Pathological Sciences advances have been made in the analysis of the antigenic structure of the typhoid bacillus, and in the preparation of a serum, which is already proving of value. Twenty hospitals in other towns, from Tientsin to Amoy, have availed themselves of the Lester Institute for section cutting and histological diagnosis. A bibliography gives a list of seventy-five publications by the staff, the Chinese members being especially prolific in this respect. The Institute suffered a severe loss in the death of Dr. Eric Reid at the early age of 29. Dr. Reid had already carried out valuable researches in local foodstuffs, especially with reference to soybean-egg powder, and other studies concerning the local aspects of fluorine toxicosis. The report would be improved by the inclusion of a table of contents and an index.

The medical unit of the University of London O.T.C. were at camp on Beachy Head, Eastbourne, last week. The syllabus of training was comprehensive, and included such matters as the organization and equipment of a field ambulance, collection and evacuation of wounded in the field, chemical warfare and protective measures against it, and demonstration of ambulance aircraft. Anyone wishing for information about the medical unit should apply to Lieut.-Colonel C. Hope Carlton, 46, Russell Square, London, W.C.1.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the metabolic diseases met with in general practice. The first group of articles on Treatment in General Practice, thirty-five in number, was republished in book form last March by H. K. Lewis & Co., and a second volume will appear in the autumn.

TREATMENT OF SOME COMPLICATIONS OF DIABETES MELLITUS

BY

O. LEYTON, M.D., D.Sc., F.R.C.P.

PART II

Neuritis

Sciatica, often bilateral, is a fairly common early symptom of diabetes mellitus. Other sensory nerves may be affected, giving rise to altered cutaneous sensation and pain over the various areas they supply. Motor fibres are less often involved, but may cause, according to the nerve affected, diplopia, weakness or paralysis of the legs, etc. ; and in severe cases the knee-jerks and the Achilles tendon reflexes may be lost.

The curative treatment consists in controlling the sugar content of the blood. Palliative treatment should relieve pain and prevent deformity or contractures. Lithium acetyl-salicylate, 15 grains three times a day, relieves the pain in most cases ; if it fails 0.002 gram dilaudid should be given subcutaneously at night to allow the patient to sleep. The application of heat is most soothing, and can conveniently be applied by an electric pad bound to the thigh. Splints will prevent contractures if any paralysis persists for more than a week or two. Massage may be tried, but in the early stage it may aggravate the pain.

Xanthoma and Oedema

Xanthoma diabeticorum is usually confined to cases of severe diabetes receiving diets containing a high proportion of fat. The cholesterol content of the blood is greatly increased, and occasionally the fat is in sufficient quantity to make the plasma appear creamy. Treatment consists in removing eggs and most of the fat from the diet and giving adequate doses of insulin. It is of some interest that a high carbohydrate diet along with moderate doses of insulin will cure xanthoma when it appears in non-diabetic patients.

Oedema of the legs used to occur in 30 per cent. of diabetics before the introduction of insulin. Now it is rare, and will usually disappear soon after the blood sugar has been reduced to normal.

True Diabetic Cataract

Fortunately true diabetic cataract is a rare complication, for the speed with which the white flakes multiply in the lens is so great that it may become quite opaque within a few weeks. No effective local treatment is known, but the progress of the condition may be arrested by vigorous treatment of the patient for diabetes mellitus. Speed in making the metabolism of the patient approach the normal is all-important if his sight is to be saved. One method is to allow no food other than half a pint of orange juice four times daily and to inject insulin in rapidly increasing doses four times a day half an hour before each drink, until the blood sugar has fallen below 0.15 mg. per 100 c.cm. of blood. Then the orange juice may be replaced by 5 oz. of bread and protein added up to 1 gram per kilogram of body weight a day.

The diet is gradually increased to about 240 grams of carbohydrate ; the protein remains unaltered and fat is added until the patient is receiving about 50 grams. This will necessitate a gradual increase in the doses of insulin, the number of which may be reduced to two daily. In a few cases restoration of sight has been recorded, but this must be so rare that it is perhaps best to inform the patient that the treatment is designed to save what sight is left, rather than raise hopes which may prove false. Senile cataract in a diabetic subject indicates that the patient should be treated for diabetes, but there is little prospect of the condition being arrested.

Retinal Haemorrhages and Exudates

Retinal haemorrhages are a manifestation of arterial degeneration, although in many cases there is no evidence of generalized arteriosclerosis, since the blood pressure is not raised ; such localized degeneration is not peculiar to the retinal vessels. Since the introduction of insulin the incidence of retinal haemorrhage has not decreased to any great extent, but only a small number of patients have as yet been treated with high carbohydrate diets and adequate insulin from the onset of the disease. Prophylaxis is the only treatment known. Retinal exudates in diabetes mellitus, like more generalized forms of oedema, are due in all probability to some toxin arising from the faulty metabolism. They are seen commonly in untreated diabetics, and will usually resolve when the metabolism is made to approach normal.

Amblyopia and Iritis

Toxic blindness is usually due to the combined effects of tobacco, alcohol, and diabetes, although it may develop on occasion in the teetotal, non-smoking diabetic. The treatment consists in stopping all smoking or chewing of tobacco, reducing the quantity of alcohol to a minimum, and adopting the usual diet, with adequate insulin. Recovery is, as a rule, rapid.

Iritis in a diabetic subject is believed to be due to the altered metabolism when the subjective symptoms are insignificant ; both eyes are affected and the uvea is involved. The treatment includes the instillation of mydriatics, dieting, and the administration of adequate insulin.

Eczema and Pruritus

Eczema of the genitalia is a common complication said to be due to the promotion of a growth of torulae and other organisms by the sugar in the urine. This explanation is not very satisfying when one remembers how rarely eczema occurs in orthoglycaemic glycosuria, even when the urine contains over 3 per cent. of sugar. The treatment consists in scrupulous cleanliness. The patient carries in a waterproof bag a small sponge wrung out in a saturated solution of boric acid and wipes the urethra immediately, and without exception, after passing urine. Eczema of the genitalia usually subsides within a week of the urine's ceasing to contain sugar ; during this interval any irritation may be allayed by the application of lotio plumbi acetatis.

Occasionally pruritus vulvae is present in the absence of dermatitis. This may prove refractory to lotio plumbi acetatis, in which case a 3 per cent. menthol ointment may be tried. If this, too, fails, a 5 per cent. solution of cocaine hydrochloride may be applied sparingly to the irritated area ; this alleviates in the majority of cases, but unfortunately for only a limited time. Cocaine in aqueous solution is not absorbed in appreciable quantity, but it must be remembered that cocaine is readily absorbed when applied as an ointment, and poisoning may result if it be used over a considerable area when mixed with fat.

Furunculosis

Furunculosis is not confined to diabetic patients, but when it does occur in them it is not only difficult to treat but it also adversely affects their metabolism. If the furuncles be large and numerous the patient should be confined to bed, washed all over twice daily with soap and water, and dusted all over with finely powdered boric acid. He should put on clean pyjamas after each washing, and be supplied with clean sheets daily. The pyjamas and sheets should be boiled to prevent reinfection. When he leaves his bed he should wear linen underclothing, which should be clean daily. The concentration of sugar in the blood will be found to vary greatly, depending upon the absorption of toxins from the furuncles. The doses of insulin should be altered from day to day as found necessary. For some unknown reason the resistance to infection may suddenly rise and the furuncles cease to develop, as if some magician had waved his wand over them. If this happens while tin or manganese is being administered the metals may undeservedly be given the credit for it.

Perforating Ulcer

A perforating ulcer of the sole of the foot may develop in cases of long-standing diabetes mellitus, especially in the presence of neuritis, which may be demonstrated by the absence of the Achilles tendon reflex. The treatment is constitutional and local ; metabolism must be made to approach the normal, and locally the hard skin around the ulcer should be softened by fomenting and removed. A radiograph should be taken to decide whether any bone is necrosed. A few years ago I thought a perforated ulcer with necrosed bone would never heal without surgical assistance. Now, having seen the bone come away and healing ensue in several cases after many weeks of fomenting and soaking in hypertonic baths, I recommend operation only when there is a good pulse at the ankle, and then simply with the object of saving time.

Carbuncle

That carbuncles are due to a want of cleanliness may be the general rule, but there are very many exceptions to it, as would be expected when it is remembered how often the necrosis of tissues begins subcutaneously. Carbuncles are said to account for 20 per cent. of deaths from diabetes, but those physicians who will countenance neither manipulation, such as squeezing or syringing with hydrogen peroxide, nor surgical incision, rarely see a case end fatally. Manipulation in any form and incision assist septic material to pass into the blood stream. The neck, which is being rubbed with the collar for many hours a day, is the site of 80 per cent. of carbuncles. As a preventive measure, therefore, it should be kept clean and dusted with boric powder. Treatment with vaccines is reported to have proved satisfactory when large doses, up to 500 millions of the *Staphylococcus aureus*, have been injected into the carbuncle itself.

Small carbuncles arising where there is plenty of loose skin may be excised completely, but this should be attempted only when the surgeon is quite satisfied that he can remove all the infected tissue. If this is done satisfactorily the wound heals by first intention and much anxiety is saved. The view of the majority at the present day is that if the carbuncle cannot be removed completely it should be left alone ; statistics show that the mortality is increased by incision, however skilful. No one advocates simple incision, but a minority favour a wide crucial incision. This may establish satisfactory drainage, but how far it increases the possibility of septic embolism remains a problem which statistics may solve.

The carbuncle should be fomented with boric acid lint over an area of at least a square foot ; an electric heating pad applied over the fomentation will obviate the necessity of frequent renewal. When the carbuncle discharges, a paste of glycerin and magnesium sulphate is applied on lint with the object of drawing fluid from the tissue into the dressing. Once the tissue breaks down nothing is gained and danger is incurred by pressing out the pus or dragging away sloughs. Pus should be allowed to run out, and only if the opening tends to close should it be stretched with dressing forceps and a tube inserted. The healing power of a novel method of treatment is usually exaggerated for a short time after its introduction, and this is true for short-wave diathermy, but evidence is accumulating that it exerts a beneficial action upon carbuncles and hastens healing. Although still in the experimental stage it may be used on patients not confined to bed.

There are but few cases recorded of patients dying from the direct extension of a carbuncle into a vital tissue. On the other hand, a carbuncle may grow to an enormous size and then for no apparent reason begin to heal, and finally leave only a small scar. The application of a spray of 2 per cent. brilliant green, or some other coloured antiseptic, in water cannot do harm, and has the advantage of camouflaging the lesion and thus preventing the patient becoming alarmed should he insist on making an inspection. Sometimes a probe may be passed half a dozen inches or more in every direction, showing that the skin has separated over a square foot ; in these cases some believe that recovery is accelerated by inserting a tube at the most dependent point, but whether this procedure is worth the risk involved is debatable.

While toxins are being absorbed from the carbuncle large and frequent doses of insulin may be required to control the sugar content of the blood, but unless these are reduced as the quantity of toxin diminishes there is a risk of severe attacks of hypoglycaemia. It is wise to determine the blood sugar of a patient suffering from a carbuncle at least twice daily—one hour after the meal containing the greatest quantity of carbohydrate and four hours after the biggest dose of insulin. The former estimation should not rise above 0.15, the latter should not fall below 0.08 mg. per 100 c.cm.

Tuberculosis

Tuberculosis fairly commonly complicates diabetes mellitus, and may become quite advanced before it is diagnosed. Two factors are responsible: first, pyrexia does not develop ; and secondly, want of energy is attributed to diabetes and the body may not be investigated for tuberculosis. It should be recognized that the resistance of any individual placed upon a diet calculated to keep him a little below average weight may be reduced, and he may thus become vulnerable to Koch's bacillus. In addition, the alteration in metabolism associated with insufficient insulin appears to lead to the formation of substances which favour the multiplication of the tubercle bacillus.

So long as the infection in the lung is confined to the tubercle bacillus insulin acts satisfactorily. The tuber-

culous diabetic is given a very generous diet, practically as much as he can eat and usually over 40 calories per kilogram of body weight a day, and part of this is in the form of fat—that is, the food chosen is of high energy and of small bulk. For a time three or even four injections of insulin are needed in order to allow the patient to take carbohydrate at every meal and to keep the sugar content of the blood below 0.15 mg. per c.cm. Some authorities believe that so long as sugar is not excreted in the urine it will be used, and therefore there is but little object in examining the blood and estimating the sugar in it. The argument, however, is not along these lines. Glycerol favours the growth of the tubercle bacillus, and though very little circulates freely in the human body there is reason to believe that the amount is greater in untreated or inadequately treated diabetics. It is important, therefore, for the treatment to be really adequate, and this can only be gauged by the sugar content of the blood. When secondary infection is implanted upon tuberculosis the activity of insulin is sadly impaired, but cases in which 50 units of insulin injected twice daily may produce but slight effect may respond to 25 units four times a day.

A generous diet of four good meals a day and four or more doses of insulin should be tried, and if, in spite of huge doses of insulin, the sugar excretion remains considerable, then synthalin should be given in the biggest doses which the patient can stand, remembering always that it has a cumulative action, and that therefore none should be given on two days a week and every third fortnight. The action of synthalin is not affected by bacterial toxin.

Local Insulin Reactions

One cause of local reactions at the site of the injection of insulin is the injection of traces of surgical spirit. Surgical spirit, which contains castor oil and boric acid, should be replaced by industrial spirit or rectified spirit in the syringe case ; if local inflammation persists then the syringe should be rinsed thoroughly with recently boiled water before use. The different preparations of insulin should be tried until one is found which gives satisfaction. Urticaria may follow the injection of insulin, and occasionally is of such intensity as to make the patient believe that he is not a suitable subject for treatment with that particular preparation. Some cases react less after injection of the most highly purified insulin and some to solutions of insulin without preservative. In the most susceptible, immunity has to be developed by beginning with minute doses of a few cubic millimetres and by increasing them slowly until the adequate dose is being administered.

Occasionally, but fortunately rarely, fat is absorbed in the region of the injection of insulin, and also at a short distance from the actual site. Since the same reaction may follow injections of pituitary extract, morphine, and other substances there is little hope of modifying the effect by altering the make of insulin or using an insulin without preservative. The loss of fat from the thighs embarrasses only those who spend much time upon the beach, and in these cases the upper gluteal region may be injected where loss of fat is not mourned.

S. T. Heidema (*Nederl. Tijdschr. v. Geneesk*, June 27th, p. 3026) reviews the literature describing death following the administration of thallium, and records the case of a woman aged 63, who on two occasions was treated for favus with thallium acetate in doses of 75 mg. per kilo of body weight. There was an interval of two and a half months between each treatment, and fifteen days after the second administration she died with symptoms of polyneuritis. There was no necropsy.

ONE HUNDRED AND FOURTH ANNUAL MEETING

of the

British Medical Association

HELD IN OXFORD, JULY, 1936

THE SECTIONS

SUMMARY OF PROCEEDINGS

During the next few months there will be published in the British Medical Journal *the opening papers communicated to the Scientific Sections of the Annual Meeting. The reports of discussions, continued from last week (page 252), are intended to give members who were not present a general idea of the proceedings.*

SECTION OF MEDICINE

Thursday, July 23rd

Flatulence and Epigastric Discomfort

With Dr. John Parkinson in the chair, the discussion on flatulence and epigastric discomfort was opened by Professor J. A. Ryle (Cambridge).

Professor Ryle suggested that attention should be directed to discomfort rather than pain, and the term " epigastrium " should embrace the lower sternal area and the right and left hypochondria. The patient should be allowed to tell his story, but a careful and exact analysis of his symptoms was all-important. It was remarkable how " near the mark " a study of symptomatology might lead. For example, a sensation of fullness or weight might be due to carcinoma of the liver or to nervous dyspepsia ; continuity of the symptom, situation of the pain—slightly to the right—aggravation by lying or turning or by deep inspiration, and loss of weight and appetite, would all point to the more serious diagnosis. " Fullness " in the abdomen might be regarded as a " gastric globus " comparable to the variety experienced in the throat.

Professor Ryle went on to discuss the significance of " bursting sensations," epigastric throbbing, " sinking " feelings, and nausea. We needed to consider more closely what patients meant when they referred to " acidity." Gastric flatulence might be odourless or foul ; the former was generally due to aerophagy with or without organic disease, while the latter might be due to pyloric obstruction or gastro-colic fistula. The aerophagy that relieved or concluded some anginal attacks, and the frequent association of anginal pain with meals, accounted for many mistaken diagnoses.

Dr. J. M. H. Campbell considered that there was no true dividing line between pain and discomfort. Cardiac pain might be epigastric or situated in the retrosternal region, and no inference could be drawn from the site regarding the type or grade of coronary disease. He referred to cases of so-called acute indigestion occurring in the night, and took the view that if there was no previous dyspeptic history, and if there was no acute abdominal emergency, then a coronary syndrome was most probably present. Flatulence was the outstanding complaint in perhaps one-third of all patients with coronary thrombosis. Dr. Campbell referred to the work of Dr. Skene Keith, who had found that in a large number of sudden cardiac deaths the patients had been under treatment for indigestion previously. Heart disease was a likely cause of the new occurrence of flatulence in any man over the age of 50.

Dr. Thomas Hunt commented on the frequency of intestinal and colonic causes of epigastric discomfort. In such cases there was usually a spread downwards of the

discomfort and a relation to nausea and food. He held that up to a point gastric gas was physiological, and that it might not only normally be passed on into the intestine, but also normally eructated. On the other hand, any belching lasting more than a few minutes was due to aerophagy. Some patients complained of fullness or distension in the stomach after a very small quantity of food had been taken ; this was caused usually by failure of normal gastric relaxation on the taking of food, and also perhaps by hurried meals and bad mastication. This might explain the increase of digestive discomfort sometimes noticed after dental extractions. Dr. Hunt had observed in his own patients that belching was a more frequent complaint in gastric ulcer than in gall-bladder disease.

Dr. A. F. HURST referred to the experimental evidence that gastric pain and discomfort had the same basis in gastric distension, the difference being one of degree. He discussed the mechanism of aerophagy, and mentioned that a frequent cause of discomfort in the upper abdomen was a collection of gas in the splenic flexure ; this was often due to an excess of undigested carbohydrate in the colon, and might be cured by reduction of starch in the diet. The rare condition of " air-lock in the stomach " had received little attention in this country ; it consisted in the gradual accumulation in the stomach of air which the patient was quite unable to bring up, but which could be passed on into the intestine and ultimately out of the rectum when the patient lay down. Causes of this derangement were an abnormal valvular mechanism at the cardia, spasm of the cardia due to oesophageal ulcer, and megacolon causing dislocation of the stomach.

Dr. JOHN PARKINSON had been impressed by the frequent absence of the complaint of wind by those patients who might be expected to show it. In this connexion he demonstrated films of achalasia of the cardia, paraoesophageal hernia, and megacolon ; in only one of these cases had flatulence been complained of, and even then it was a subsidiary symptom. Congestion of the liver in heart disease was sometimes a cause of epigastric pain ; a patient of determined disposition might carry on in spite of his malady until he developed epigastric pain on exertion, due to threatened cardiac failure. Pain in the chest on exertion was seldom caused by any condition other than angina.

Dr. T. R. DAVIES (Llanelly) regarded aerophagy as an attempt to relax the cardia ; an air bolus was substituted for a food bolus in an effort to relieve gastric hypertension. Dr. H. W. RODGERS gave an account of variations in the gastric mucosa that might be observed by gastroscopy. In ulcer the folds of the mucosa were higher and less easily obliterated by distension, whereas in pernicious anaemia the folds were absent. He believed that there might be some variability in the sensitiveness of the stomach, and that carcinoma might be specially likely to develop in the " tough " stomach, provided the exogenous factor of irritation was present.

Dr. R. PLATT (Sheffield) referred to arthritis of the spine as an occasional cause of epigastric pain. Radiation to the back and relation to posture or jolting were further features indicating a spinal origin. He had seen a patient in whom long-standing pain in the right upper quadrant had developed as a sequel to herpes zoster in this region. Dr. W. CAMERON DAVIDSON (Torquay) drew attention to the fact that epigastric pain might be due to patches of rheumatic fibrositis, since these were particularly common in this part of the abdominal wall. Dr. F. H. MOSSE (China) mentioned the possibility of gastric syphilis as a cause of abdominal symptoms in Oriental practice. Colonel H. STOTT (Lucknow) said that epigastric discomfort was common in practice in India, and that the causes of this were the large amount of carbohydrate in the diet, and the frequency of ankylostomiasis and of gastric ulcer.

In reply Professor RYLE held that flatulence must be distinguished from what patients believed to be flatulence. They were mostly unable to separate sternal oppression from true dyspeptic symptoms. He regarded aerophagy as a conditioned reflex developed in an attempt to dislodge wind that the patient imagined was there. Pharyngitis and dental trouble were other causes of air swallowing. In reply to a question of Dr. Rodgers, Professor Ryle considered that trial treatment in suspected gastric cancer was very rarely justifiable, since severe symptoms might be relieved even in patients with advanced carcinoma.

SECTION OF SURGERY

Thursday, July 23rd

Treatment of Intracapsular Fractures of the Neck of the Femur

With the President of the Section, Professor G. E. GASK, in the chair, a discussion on the treatment of intracapsular fractures of the neck of the femur was opened by Professor ROYAL WHITMAN (New York), whose paper was published in full in our issue of July 25th (p. 167).

Mr. GWYNNE WILLIAMS said there were two distinct types of intracapsular fracture. The first was the fracture impacted in a position of abduction, which almost invariably united if left to itself. The second was the unimpacted fracture in a position of adduction. This showed no tendency to bony union ; it was round this second type that the discussion centred. Professor Whitman had shown that bony union could be achieved in such cases, but the difficulty was to assess the probability of such a happy result. The literature was unhelpful. Statistics of end-results gave percentages of bony union varying from 90 to *nil*. He had had seven instances of bony union in thirty cases.

The Smith-Petersen three-flanged-nail method seemed to him to offer a more certain result. He had used it in thirty-one cases. In six of these the patients died, two of pulmonary embolism on the tenth day, one a year after the operation from infection at the time of operation, one of septicaemia fourteen days after redriving a nail which had slipped out of the head, one of erysipelas from a sore on the heel three months after the operation, and the last from pyelonephritis a month after the operation. That was the black side of the picture. On the other hand there was bony union in twenty-two of the remaining twenty-five cases. In addition to such good end-results, Mr. Gwynne Williams emphasized that the patients had a relatively easy convalescence ; they could be up and out of bed in three weeks, and there was none of the stiffness of the knee which commonly followed immobilization in plaster for three months. He thought that the Smith-Petersen pin had solved the problem of fixing the bone-graft-like head of the femur to the neck. A point to be discussed was the relative merits of the closed and open operations for the introduction of the pin. He himself had employed the Smith-Petersen technique, modified only by a less extensive and a straighter incision.

Mr. E. I. LLOYD said that the Smith-Petersen method was an offspring of Professor Whitman's work, although Professor Whitman might doubt its legitimacy. Mr. Lloyd had not had very fortunate experiences with the abduction method. Not only had he had poor results as regards bony union, but the discomforts of the plaster were frequently more than the patients could bear. Many patients with this fracture were fat women, whom nature had endowed with a figure ill suited to the treatment. He believed in the lateral approach, and had more recently been using an alignment apparatus for inserting the Smith-Petersen nail. This apparatus directed the nail with mathematical precision, and was independent of directing wires, which he considered dangerous. Radiographic control of a high standard was essential. He had now operated upon thirty-three cases, but considered his statistics as yet incomplete, in that sufficient time had not elapsed. Four of the patients had died: two from causes unassociated with the operation ; another, a man of 77, had died of uraemia on the sixteenth day ; while the fourth, a woman of 77, died of pulmonary embolism on the twelfth day. There had been no deaths from shock, haemorrhage, or sepsis. The average age in the series was 64 years. The value of the operation was now proved ; it had passed the experimental stage and was approaching standardization. Precision in the insertion of the nail was the all-important factor.

Mr. K. H. Pridie (Bristol) divided these fractures into three clinical groups: (1) those occurring in the aged and caused by slight violence; (2) those occurring in the middle-aged, when the bone was healthy and considerable violence had been sustained; and (3) the latent fracture, detected a little time after the injury. For the middle-aged patient, who was usually a wage-earner, the Smith-Petersen method was indicated. The open operation, as described by Mr. Watson Jones, was the most certain and quickest way to recovery of full function. The clerk was able to return to work in three months, and the manual labourer in nine to twelve months. After fourteen days the patient could move about freely in bed; after two months he could move about at home and keep his muscles in good condition. The average stay in hospital for this class of patient was three weeks. Mr. Pridie said he always removed the pin after nine months. In the older and feebler patient introduction of the pin by the blind method, using Mr. Hey Groves's director, was more suitable, resulting in less shock. He had not been impressed by the results of the abduction method.

Mr. Ivor Lewis presented a series from the North Middlesex Hospital. Twenty-four cases had been treated by the Whitman method, and in 62 per cent. there had been bony union. Of twenty-two treated by the Smith-Petersen nail 73 per cent. had had bony union; 84 per cent. in the survivals. He practised the Johannsen method of introduction of the pin. The best course eventually might be to treat all early cases by the Whitman method, retaining the Smith-Petersen method for cases which were ununited.

Sir William de Courcy Wheeler said he had had the privilege of seeing Professor Whitman at work in New York, and he thought all recent improvements were essentially based on that work. The aim of recent workers had been to introduce the Smith-Petersen pin without open exposure; this obviously was the proper line. When an open method was indicated the lateral exposure of J. B. Murphy was admirable. Mr. E. S. Allen (Newport, Mon.) asked for an opinion on the advisability of low implantation of the pin. Mr. Pridie replied that this tended to cause rotation of the head of the femur.

Professor Whitman, in replying, said that he was chiefly concerned with the establishment of the positive standard. Operative treatment was in accord with this standard, but it applied to but one type of fracture and was practicable only under special conditions, as had been clearly demonstrated by the previous speakers. Abduction treatment by contrast was equally effective for every form of fracture, and in competent hands was practicable under any conditions. The most effective agent in aligning and fixing the fragments was tension on the enclosing capsule, a tension which required complete extension and abduction of the limb. He thought the difficulties, discomforts, and danger of the treatment had been greatly exaggerated. Patients, as a rule, were quite willing to submit to a restraint that relieved pain and offered a fair assurance of relief from what, in the popular mind, was permanent disability.

Mr. K. H. Pridie (Bristol) subsequently showed three cinematograph films illustrating the treatment of fractures of the shaft of the humerus, fractures of the phalanges, and the ambulatory treatment of fractures of the leg.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Thursday, July 23rd

Origins of Movements in the Foetus

Sir Joseph Barcroft (Cambridge) showed a film on foetal movements in sheep, Professor H. Beckwith Whitehouse (Birmingham) being in the chair.

The film consisted of a series of views of the living embryo covering events of foetal life in the period ranging from the 35th to the 50th day of foetal life, the period of gestation in the sheep being 140 to 150 days. About the 35th day the foetus gives an extensor spasm on stimulation of the nose—later several extensor spasms in succession—and by the 38th day a rhythm appears even without any very definite stimulus. By the 40th day the spasms become more restricted in character, the extensor elements tending to drop out, and a rhythm of flexor movements involving the head, mouth, legs, and trunk remains. As the days pass the movements become still more restricted till by the 47th day they are confined usually to the body and diaphragm, and have all the appearance of respiratory movements. At a later stage they disappear, but can be elicited by occlusion of the cord. Any muscular movement tends to make this rhythm more powerful and more rapid.

Professor J. C. Windeyer (Sydney) remarked on the frequency with which human anencephalic embryos performed continued purposive movements *in utero*, and asked whether this might be due to absence of inhibitory centres. Sir Joseph Barcroft, in reply, said that in the present state of knowledge no positive answer could be given to this question, but he had noticed that removal of the foetal brain down to, and encroaching on, the medulla was followed by most active movements on the part of the embryo. Whether this was due to the removal of centres of inhibition or to the stimulus occasioned by the operation itself he was at present unable to say.

COMBINED SECTIONS OF OBSTETRICS AND TUBERCULOSIS

Thursday, July 23rd

Pulmonary Tuberculosis and Pregnancy

The discussion on pulmonary tuberculosis and pregnancy was opened by Professor Henry Cohen (Liverpool), Dr. W. Stobie (Oxford) being in the chair.

Professor Cohen said he approached the subject of tuberculosis and pregnancy as a general physician, and it appeared to him that the questions at issue were: (1) Did child-bearing activate a latent or quiescent lesion? (2) Did child-bearing accelerate progress in active pulmonary tuberculosis and precipitate a fatal issue? (3) Was child-bearing beneficial to a mother suffering from pulmonary tuberculosis? This last question would only arise if the answers to the first two were in the negative. He gave statistics showing that the truly latent or quiescent lesion could not be said to be affected by child-bearing in any way, but that where the lesion was active the occurrence of pregnancy appeared gravely to prejudice the chances of recovery. If the different types of pulmonary tuberculosis were analysed separately, it was found that the caseous-pneumonic type was the cause of the majority of fatalities when associated with pregnancy. The deleterious effects of pregnancy were at first the result of the increased metabolic demands on the mother; the strain of labour and lactation also played an important part. Professor Cohen could find no evidence to support the old theory that pregnancy was sometimes of benefit to the tuberculous patient.

The most important factor when dealing with the pregnant tuberculous patient was the care of the lung condition by the strictest sanatorium principles, and the question of accessory measures such as artificial pneumothorax should be considered. It was probable that the termination of cases of early pregnancy complicated by tuberculosis was of value in certain cases, but care should be taken to cause the minimum of trauma. Figures had shown that it was essential to remove the child immediately after birth if the mother had an active pulmonary lesion, as otherwise there were grave risks of the mother infecting the infant.

Professor James Young believed that labour and the periods which immediately preceded and followed it caused the chief danger to the pulmonary lesion. He showed a series of temperature charts of tuberculous patients under his care, in which the normal ante-partum readings were followed by pyrexia in the puerperium. Induction of abortion was a valuable method of treatment in selected cases in the early weeks of pregnancy, but it should be carried out with care so as not to aggravate the pulmonary lesion. Other cases should be under sanatorium treatment during pregnancy. He deplored the fact that facilities were not available for the mother to be confined on the sanatorium premises, since it was most important that she should be under the same supervision throughout

Dame Louise McIlroy considered that the previous speakers had taken a pessimistic view of the whole subject. She disagreed with the dictum that a woman with pulmonary tuberculosis should be forbidden to marry, and thought that instruction in contraception was a valuable alternative. In quiescent tuberculosis the prognosis was poor unless there was a lapse of two or three years before pregnancy began, but the prognosis in chronic tuberculosis and pregnancy was comparatively good, especially in multiparae. She agreed that the lung condition should receive most careful treatment, and was seldom in favour of inducing abortion or of any surgical treatment. It was important to procure a painless labour, and this was best secured without the use of inhalation anaesthetics.

Dr. M. H. Logg said that in a large experience of tuberculous women who had borne children he had found that the great majority dated their first symptoms from a pregnancy or a lactation. There was a slight improvement in the lung condition during the first three or four months of pregnancy, but after the fifth month gradual deterioration took place, though this could be minimized by suitable treatment. He had never seen a case in which any permanent improvement had been caused by pregnancy ; in fact in any women suffering from pulmonary tuberculosis one pregnancy was a risk and two a disaster. There should be a complete examination of the chest of every woman before marriage and again at the beginning of pregnancy, to exclude pulmonary disease. If the pregnancy was early it should be terminated between the twelfth and sixteenth weeks, but if this period had been passed, attention should be paid solely to the treatment of the chest condition, the use of artificial pneumothorax being of great value. Dr. Logg also emphasized the importance of facilities in sanatoria for the conduct of confinements.

Dr. G. T. Hebert said that tuberculosis had little effect on pregnancy except, perhaps, to cause some slight tendency to premature labours and post-partum haemorrhage. With regard to the effect of pregnancy on tuberculosis he considered that parturition and the puerperium were the chief dangers, and that pregnancy itself had little or no adverse action on even a mildly active tuberculous lesion. Careful sanatorium treatment was the most important factor in the treatment of the condition, although in certain circumstances he advocated early induction of abortion.

Dr. Johs. Gravesen (Denmark) found that there were two critical periods in a pregnancy associated with pulmonary tuberculosis: (1) during the first two or three months of pregnancy ; and (2) during labour. If the lung condition did not deteriorate during the early weeks the patient could go to term with comparative safety, but if the condition grew worse in the early weeks there was still time to terminate the pregnancy. In his sanatorium the patients were confined on the premises. The child was immediately removed from the mother, and was returned when the mother was cured. Mr. L. Carnac Rivett said that he strongly advised patients with pulmonary tuberculosis against marriage. When termination of pregnancy was advocated he thought that in many cases either temporary or permanent sterilization should also be performed. Sir StClair Thomson, speaking as a laryngologist, said that pregnancy associated with tuberculous laryngitis was almost always fatal, so much so that even induction of abortion would not save the patient.

Sir Ewen Maclean (Cardiff) hoped that provision would be made in the future for the establishment of maternity departments in sanatoria, and held that such a provision should be an essential part of any national maternity service. Professor J. C. Windeyer (Sydney) said that there was no provision in Australia for confinements to be conducted in sanatoria. The tuberculosis problem was less acute there than it was in England. Dr. J. R. Gillespie (Co. Down) said that in his district patients were treated in sanatoria throughout pregnancy, transferred to hospital for delivery, and then returned to the sanatoria.

In closing the discussion Professor Cohen said that the pessimism of which they had been accused had been only too well justified by the results. The figures quoted by Dr. Hebert could be equally well made to prove that pregnancy was a grave additional risk to the tuberculous patient. Professor Young also spoke again, and said that the deleterious effect of pregnancy on tuberculosis had, in his submission, been proved.

SECTION OF OPHTHALMOLOGY

Thursday, July 23rd

Choroideremia

With Sir Stewart Duke-Elder and subsequently Mr. C. G. Russ Wood (Oxford) in the chair, Dr. A. J. Beddell (Albany, U.S.A.) read a paper on choroideremia. He defined the condition as one showing night-blindness, retained central vision, and a pathognomonic fundus. Drawing on thirty-two cases under his care, he showed photographs and drawings to illustrate the progressive character of the affection. He thought that probably the first sign was a zone of circumpapillary pallor, gradually deepening into retinal and choroidal atrophy. Choroidal sclerosis was the next stage. Extensive atrophy of retinal and choroidal pigment followed, gradually leading to the characteristic fundus appearance, with marked narrowing of the choroidal vessels and disappearance of pigment. The rate of progress varied in different cases ; the condition was bilateral, and the speaker had observed it in three members of one family. In most cases the night-blindness came on only during the progress of the affection. The speaker did not consider it as an anomalous form of retinitis pigmentosa, and the appearances were sufficiently characteristic to distinguish it from syphilitic choroiditis and from myopic fundus changes.

Bitemporal Hemianopia

Mr. Norman Dott (Edinburgh), in a paper on bitemporal hemianopia in relation to hydrocephalic distension of the third ventricle, drew attention to the fact that all the symptoms attributable to a pituitary tumour might be met in hydrocephalus. The symptoms common to both conditions—bitemporal hemianopia, distended sella, hypopituitarism, and hypothalamic disturbances—were illustrated by the histories of five personal cases, three being cerebellar tumours and two sequelae of meningitis. The significance of this parallelism for differential diagnosis was obvious. Ophthalmoscopically the associated optic atrophy was combined with papilloedema. Field defects tended to clear up after operation, though the optic atrophy persisted.

Dr. H. M. Traquair (Edinburgh) congratulated Mr. Dott on having added another to the known causes of bitemporal hemianopia. In contrast to the hemianopia from chiasmal lesions, Mr. Dott's cases showed little of the definite sequence of quadrantic defects ; furthermore, there was papilloedema, which was rare in pituitary tumours. Bitemporal hemianopia had been reported in cases of brain tumour with papilloedema, but the possibility of depression of vision rather than of chiasmal interference had to be considered.

Biochemistry of the Lens

Dr. Dorothy Campbell (Coventry), in a review of biochemical work on the lens, classified the methods recently used for the experimental production of cataract as: (1) the administration of a high carbohydrate diet ; (2) diets deficient in vitamins A, B_2, or C ; (3) the production of hereditary cataract in animals ; (4) the administration of certain toxic substances. Pointing out the relation of experimental results to certain clinical problems of cataract in man, such as diabetic cataract, the recently reported deleterious effects of dinitrophenol on the lens, and the possible effects of nutritional disorders on the inheritance of cataract, she discussed in detail the metabolism of the cataractous patient with regard to glutathione and vitamin C in the blood, and to sulphur metabolism as a whole. Several new constituents had been identified in the lens, of which vitamin C was of importance in the oxidation processes of the normal lens. She further dealt with the source of vitamin C and its chemical relation to glutathione in the lens.

Chronic Iridocyclitis

Mr. T. J. PHILLIPS (London), in a paper on autohaemotherapy in chronic iridocyclitis, gave an account of Schieck's technique and of his own modification for the injection of blood into the anterior chamber in cases of iridocyclitis. Hospitalization for two or three days was necessary. The chamber was emptied of aqueous and filled with autogenous blood; the patient was made to sit up in bed for four hours and then allowed to walk about to prevent the blood from becoming adherent to the lens. Heat and atropine were given. Untoward complications were not observed. During the past eight months the speaker had treated fourteen cases by this method: 35 per cent. showed clinical recovery, 28 per cent. were improved, 21 per cent. improved but relapsed, and 14 per cent. did not respond at all. Owing to its effect on clearing up keratitic precipitates and in breaking down synechia this mode of treatment was useful.

Mr. T. HARRISON BUTLER (Birmingham) thought that such treatment should be controlled by tonometer readings, and that serum instead of whole blood might be used. Mr. N. BISHOP HARMAN and Mr. H. NEAME discussed the therapeutic significance of emptying the anterior chamber involved in this technique. In reply to Mr. D. V. GIRI (Eastbourne), who wished to know if the autogenous blood had to be citrated to prevent coagulation before injection, Mr. Phillips said that such measures were unnecessary.

Corneal Transplantation

Mr. J. W. TUDOR THOMAS (Cardiff) reviewed the results of various surgeons, including his own, with corneal transplantation. Successes in suitable cases varied from about 43 per cent. to about 83 per cent. His best case was a patient whose vision was improved from fingers at 2 feet to 6/12 and 6/9 partly, with nearly a full field of vision. Comparison of different techniques was difficult, as there was no uniformity in regard to the standards of success or the grouping of the cases. He presented a scheme for adoption by surgeons interested in this type of work for use as a summary in future publications. The standard of success must be the degree of transparency of the graft, including any new tissue formation posterior to it, after a period of, say, six months, irrespective of the visual acuity, although that may also be a useful guide. A transparent graft on a partially amblyopic eye would be incorrectly assessed if judged by visual acuity alone, but correctly assessed if judged by its transparency. The following was the scheme recommended, with the speaker's results entered.

Scheme for Classification of Results of Corneal Transplantation

Results of 36 Operations on 32 Eyes by J. W. Tudor Thomas

		Group A	Group B	Group C (Unfavourable Eyes). By Reason of—		
		Suitable Eyes in Favourable Patients	Suitable Eyes in Unfavourable Patients—*e.g.*, a Baby, or Much Nystagmus, etc.	(*a*) Extra-ocular Conditions—*e.g.*, Symblepharon, etc.	(*b*) Intra-ocular Conditions—*e.g.*, Anterior Staphyloma, etc.	(*c*) Extra- and intra-ocular Conditions
Successes	*Group 1:* Clinically transparent	5	0	0	0	
	Group 2: Slight degree of opacity in or behind graft	6	1	0	0	
	Group 3: Much opacity, but less than original corneal opacity	4 — 15=83%	2 — 3	1 — 1	2 — 2	
Failures	*Group 4:* Much opacity, equal to, or worse than, original corneal opacity	3 — 3	2 — 2	5 — 5	4 — 5	
	Group 5: Graft detached	0	0	0	1	
	Group 6: Eye lost	0	0	0	0	

He held that corneal transplantation in suitable cases had now ceased to be experimental.

Dr. H. M. TRAQUAIR (Edinburgh) drew attention to the improvement in the periphery of the cornea following central grafting, analogous to the improvement in the skin in facial lupus following plastic operations on the lids in this condition. Lieut.-Colonel E. W. O'G. KIRWAN (Calcutta) showed a series of drawings illustrating the end-results of corneal grafting operations he had done. Mr. TUDOR THOMAS thought age was not an unfavourable factor, nor homologous blood grouping an essential factor in successful operation.

The Eye in Leprosy

Mr. E. F. KING (London), in a profusely illustrated paper on the eye in leprosy, recalled the high incidence of ocular involvement in this affection. Of fourteen lepers under his care ten had eye lesions, distributed over the eyebrows, lids, extra- and intra-ocular nerves, lachrymal apparatus, and globe. The changes in the cornea and iris were pathognomonic, the corneal condition being a chalky, dot-like infiltration of the substantia propria, and that of the iris a nodular infiltrate. Fundus changes had been reported, but the speaker could not confirm these. Lieut.-Colonel E. W. O'G. KIRWAN (Calcutta) showed a further series of drawings to illustrate the character and course of leprotic eye lesions.

Intracapsular Extraction

Mr. H. H. MCNABB (Manchester), in a paper on intracapsular extraction, gave the results of a modified Sinclair operation performed in 150 cases at the Royal Eye Hospital, Manchester. He did not make the corneal section till twenty minutes after the retro-ocular injection. The softening of the globe thus obtained lessened the risk of loss of vitreous and of dislocation of the vitreous after extraction. Instead of a lid retractor he used two sutures in the skin near the margin of the upper lid, the lower lid being held apart by a single suture. The lens capsule was grasped by a special pair of forceps with splayed ends, which pushed down the rim of the iris and prevented its being caught by the forceps. Vitreous was lost in six cases, resulting in one lost eye but 6/6 vision in the others. Hyphaemia and striate keratitis were fairly frequent, but always cleared. The visual results were as follows:

	Per cent.
104 with 6/6 or better	69.3
21 with 6/9–6/12	14.0
21 with 6/18 due to disease of eyes	14.0
3 with 6/18 without apparent disease of eyes...	2.0
1 lost eye	0.7
	100.0

Lieut.-Colonel E. W. O'G. KIRWAN (Calcutta) said that he employed the intracapsular method in 50 per cent. of his cases. The Smith method was good for morgagnian cataract and for cataract in old people. The Barraquer operation required extreme care. The safest method was removal with forceps.

SECTION OF DISEASES OF CHILDREN

Thursday, July 23rd

Wasting in Infancy

At a meeting of the Section of Diseases of Children on July 23rd, with Dr. FRANCES BRAID (Vice-President) in the chair, a discussion was held on wasting in infancy. Dr. R. C. JEWESBURY (President of the Section) defined the term "wasting" as a condition of malnutrition of the infant from any cause, and he enumerated the most important causes under the headings: dietetic errors, infection, environmental, constitutional, birth injuries, prematurity, and "marasmus" or infantile atrophy. Dealing first with dietetic errors, the speaker emphasized the better position of the breast-fed infant in this respect, and he gave a detailed analysis of over two hundred infants admitted for excessive malnutrition to an institution. Among the breast-fed infants it was mismanagement, he said, which appeared to be the most important cause of failure. In bottle-fed infants the chief

cause of malnutrition was unsuitable food, and he outlined his views on the artificial feeding of infants, commenting on the low percentage of protein—1.6 per cent.—advisable during the first six months of life. Turning next to infection as a cause of wasting he spoke of the rarity in infancy of gastro-enteritis due to any specific organism, and emphasized the importance of parenteral infections in any child suffering from prolonged wasting. Lastly, Dr. Jewesbury spoke of "marasmus" as a wasted condition resulting essentially from more or less complete non-absorption of food for no very obvious reason. He stressed the great value of breast milk for marasmic babies, and spoke of the use of intramuscular injections of whole blood.

Dr. H. T. Ashby (Manchester) said that the most important factor in securing healthy infants was maternal care. He agreed that underfeeding was a common cause of wasting and that mothers did not always realize that their infants, if breast-fed, were not getting sufficient quantity. More encouragement in the early days, he continued, would greatly increase the number of babies who were successfully breast-fed, and would counteract the gratuitous false advice constantly received from grandmothers and other relatives. In artificially fed babies too dilute a milk mixture was a frequent cause of wasting, and unsuitable foods, often of a proprietary nature, were also to blame. Dr. Ashby next mentioned the "nervy" type of baby, usually the product of a "nervy" mother, requiring great tact and firmness on the part of the doctor to keep it going on well. Too much protein in the diet did not seem to cause much trouble, but too much fat (as in cream or top milk) or too much carbohydrate might lead to wasting. In the treatment of the wasted baby Dr. Ashby stressed the importance of mothering, warmth, and regular weighing. A good standard feed was a simple milk-and-water mixture, which, incidentally, was very much cheaper than dried milk. The teat must always be remembered when a bottle-fed baby failed to thrive. Lastly, Dr. Ashby mentioned that excessive administration of vitamins might lead to wasting.

Dr. C. K. J. Hamilton agreed that a large proportion of wasted babies were simply underfed, largely because no attempt had been made to calculate the caloric requirements. This was largely due to the use of too dilute feeds, the protein intake being often inadequate. Insufficient sugar, especially when a dried milk was used, was another not uncommon cause of wasting. Habit vomiting was an insidious cause of wasting, because it might scarcely be noticed and the total food intake might appear to be adequate; concentrated foods were useful in this condition. Regarding the part played by infection, Dr. Hamilton mentioned the importance of relatively minor subacute infections—for example, of the skin. There was much evidence to suggest that infection was an important cause of all severe cases of wasting, especially if associated with vomiting and diarrhoea. Hence in treatment the first step must be to remedy if possible any underlying disease. Next the quantitative side of the diet must be reviewed, aiming at fifty calories per pound of expected body weight per day. Breast milk was the ideal food, but for the very wasted infant it might have to be enriched by the addition of a skimmed dried milk powder. Lactic acid milk was of great value both in theory and in practice.

Dr. J. V. C. Braithwaite (Leicester) protested against adding the term "marasmus" to the three main groups of wasting—alimentary, constitutional, and infectious. He also warned his listeners against a growing tendency to disparage the value of breast-feeding. In his own experience he had been struck by the extreme importance of infection as a cause of wasting in infancy, and even when the wasting appeared to be of a simple alimentary nature a latent infection was sometimes found later. He was surprised that little mention had been made of babies of the class of "nervous unrest," which appeared to him to be a common cause of failure to do well on the breast. Getting the baby to sleep by means of sedatives was the sheet-anchor of treatment here. With bottle-fed infants Dr. Braithwaite thought that fat was the commonest cause of trouble, and he deprecated the habit of adding fat to milk mixtures in an attempt to produce so-called "humanized" milk. He also thought the use of lactose was a frequent cause of trouble, and not nearly so satisfactory as cane sugar.

Dr. W. E. Crosbie (Liverpool) spoke of the part played by infection in causing wasting in infancy, and discussed the varieties of middle-ear disease met with, this being the commonest infection found in his experience. He also quoted figures to indicate how the mortality rate among infants was higher the greater the degree of underweight present when the infants were admitted to hospital. Dr. K. H. Tallerman, while agreeing that infection was important, thought that the commonest cause of wasting was frank starvation, especially due to the use of weak feeds of the "equal parts of milk and water" type. He stated that the attempt to make an infant ingest two and a half ounces of fluid per pound of body weight daily might also lead to wasting; smaller, more concentrated feeds gave better results. The term "marasmus" appeared to him to be thoroughly bad. Dr. C. Asher (Liverpool) suggested that some wasted infants had endocrine defects. Certain experiences with insulin supported this view, and some success in treating wasted infants had also been achieved by the use of thyroid gland. Dr. Cecily D. Williams (Gold Coast) stressed the importance of "mothering" in the prevention and management of wasting. Babies appeared to do better in her experience if handled frequently. Wasted babies also appeared to do better on more frequent feeds than were usually advocated. She also used sedatives for certain babies and advised the use of a quick teat in bottle-fed babies. Dr. Frances Braid (Chairman) thought that in a large number of cases where breast-feeding failed four-hourly feeding had been started too early.

Diabetes in Childhood

Dr. C. F. Harris (Vice-President) took the chair for a discussion on diabetes mellitus in childhood. Dr. W. W. Payne presented a summary of seventy-one cases seen at the Hospital for Sick Children, Great Ormond Street, during the past ten years.

He emphasized the classical nature of the symptoms of the disease in childhood and the very short period which elapsed between apparent normal health and unmistakable disease. The use of sugar tolerance curves in diagnosis must be carried on for three hours in all cases—that is, longer than in adults. Regarding treatment, Dr. Payne said that, first, the child must be kept happy, active, and healthy; and secondly, the progress of the disease must be arrested so far as possible. Diet must allow of normal growth, but there was no satisfactory formula for working out calorie requirements. Tolerance for carbohydrates regularly increased after raising the carbohydrate-fat ratio. So far as possible the diet prescribed should be that of a normal child, but its composition must be known. Insulin should be given, continued Dr. Payne, in sufficient amount to remove all symptoms of the disease. Children showed a great instability of blood sugar levels, and this led to some difficulties with the spacing of insulin dosage. The acid test of success with diabetic children was their progress in their own homes, and it was important to minimize the psychological effect upon the children of knowing that they had diabetes. In conclusion, Dr. Payne discussed certain points in relation to hypoglycaemia and other complications.

Dr. Leslie Cole (Cambridge) described his experiences with twenty-one cases of diabetes in which the disease began before the age of 14. The whole series covered approximately 110 diabetic years; there had been three deaths, only one of which was really due to diabetes. Regarding aetiology he mentioned three cases of the development of diabetes within a few weeks of an attack of mumps. He stressed in discussing treatment the fact that every case of diabetes mellitus in childhood required insulin as soon as possible. The disease should be brought under control—that is, there should be no glycosuria and no ketosis—with a normal or subnormal blood sugar level within forty-eight hours, after which the child could proceed to a comparatively low diet with

100 to 120 grams of carbohydrate for six to twelve months, followed by a gradual increase both in carbohydrate and in total food intake. The children must grow and develop normally and feel fit, and this was the basis of treatment. Sexual development appeared to be delayed in some patients. Dr. Cole, in conclusion, discussed the management of coma and other complications. He said that he knew of no fatality from hypoglycaemia. Dr. G. V. ASHCROFT (Manchester) asked about the value in the diagnosis of hypoglycaemic coma of an extensor plantar response. Dr. P. C. MALLAM (Oxford) stressed the fact that diabetes in childhood differed essentially from upsets in the carbohydrate metabolism in elderly subjects. In youth it was a disease and in later life merely an atrophy of function. He thought that few cases of diabetes developing before 8 years of age survived past 25 years, and he stressed the dangers of school life. Dr. C. F. HARRIS asked about experiences with protein-bound insulin, and mentioned the danger of insulin being injected into a vein.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE

Thursday, July 23rd

Delirious States

With Dr. T. S. GOOD in the chair, Dr. BERNARD HART opened a discussion on delirious states. Dr. Hart said there was no clear definition of the states which he included under the deliria. Did they belong to a precise and definable syndrome with a specific causation and mechanism? Did deliria resulting from different causal agents present specific features, so that the nature of the agent could be inferred with certainty from the clinical picture? What part did constitutional and psychogenic factors respectively play in the causation of deliria ; and did the study of delirious states enable conclusions to be drawn concerning the mode of production and origin of psychogenic symptoms in general? Delirious states ranged by perceptible gradations from the typical picture as supplied by febrile delirium or delirium tremens to conditions with apparently remote relations to it. The main groups were: toxic—exogenous and endogenous ; deliria occurring in senile psychoses, general paralysis, and traumatic conditions ; " attenuated deliria," which included " confusional insanity " ; deliria occurring in excessive fatigue and emotional stress ; and typical deliria arising in the course of other disorders such as schizophrenia and hysteria.

Our knowledge of causation of deliria was limited to the statement that in a majority of cases deliria were preceded by factors which were included under the indefinite term " toxic." In discussing pathogenesis we entered the sphere of hypothesis and speculation. Dr. Hart considered Hughlings Jackson's theories of delirium as resulting from a " destroying " lesion of the higher centre with the release of the lower. It was, moreover, possible that the lower centre might itself be the seat of a lesion of the " discharging " type. Discussing the significance of the terms " organic," " functional," and " psychogenic," in relation to the deliria, Dr. Hart said that if delirium was due to normal lower centres overacting as the result of a " destroying " lesion of higher centres it was psychogenic, but if the lower centre was itself the site of a lesion then the pathogenesis of the delirium was at least partly organic.

Dr. R. DESMOND CURRAN said that prognostic deductions were more difficult in cases which departed from the typical delirious syndrome. The same disturbance could be produced by many causes differing only in so far as the " noxious dose " differed in intensity and duration. Certain people and families appeared to have a personal and constitutional predisposition to delirium. In the majority of cases the delirious state cleared up when physical recovery occurred, but there were some important exceptions, especially when the delirium arose in the course of, or as a prelude to, a psychosis. Puerperal delirium formed an important group. In cases without a marked exogenous factor the prognosis was worse than in the obviously toxic. The constitutional and personal factors must never be lost sight of in assessing prognosis.

Dr. J. S. I. SKOTTOWE (Aylesbury) said that, setting aside the deliria associated with frankly definable poisons, such as alcohol, and with localized lesions such as pneumonia and typhoid, there remained the toxic and exhaustive delirious states included under the very unsatisfactory term " acute confusional insanity." There were profound changes in this group at the somatic and central nervous levels, and emotional and conative patterns were released in the more personal part of the psyche. It was not easy to know at which level the change began. Nutrition was the first necessity. Artificial feeding should be started at once if food was refused. Generous fluid intake was essential. Generalized detoxication was advisable, and patients should be nursed in bed in the open air. At the psychic level treatment by prolonged narcosis by barbiturates was the most successful. On recovery the patient was in a suitable state of suggestibility for psychotherapeutic treatment. This system of treatment required mental hospital conditions. Delirious patients should never be certified, but admitted in the temporary category.

Dr. WILLIAM BROWNE (Oxford) said that delirious states occurred in 1 per cent. of his cases treated by prolonged analysis. A possible toxic factor could not be excluded, but such delirious states were largely due to an affection of the vegetative nervous system and endocrine glands as a result of the rapid release of certain repressions and the evolution of reactions at a deeper psychological level. Professor FOSTER KENNEDY (New York) said that in delirium there was a reversion to a primitive type of thinking. Dr. FREWEN MOOR (Norwich) considered that the experience of a general practitioner was mostly with delirium as a terminal stage in old people. Night delirium with disorientation of place was a typical feature. Dr. LUCY VAN DAM (South Africa) stated that the prognosis of the Korsakoff syndrome was very bad in South Africa. Dr. ELIZABETH CASSON (Bristol) thought that the high degree of amnesia in delirious states might account in part for the increased suggestibility. Dr. R. EAGER (Exminster) agreed with Dr. Skottowe about the importance of beginning tube-feeding early. He was strongly in favour of prolonged narcosis. Dr. GEORGE RIDDOCH pointed out that in traumatic delirium there might be some cerebral anoxaemia.

The PRESIDENT spoke of the value of anthropometric investigations. He did not agree with the use of the feeding-tube or with prolonged narcosis with barbiturates, but agreed with the need for building up the patient's resistance. Gramophone records of patients' delirious ramblings had afforded much information as to the psychological causes of their illness. The hysteric frequently became schizophrenic, and the anxiety state was more akin to the manic-depressive psychosis.

Observations on Phantom Limbs

Dr. GEORGE RIDDOCH, in a paper on some points in regard to phantom limbs, stated that after amputation it was usual for the patient to experience sensations as if his limb was still present. These phantom limbs might be painless or painful. Painless phantoms occurred in several conditions: after amputation of limbs or other parts ; without amputation in lesions affecting peripheral nerves, a nerve plexus, posterior roots or columns ; or after complete division of the spinal cord. Painful phantoms only appeared after severe lesions of peripheral nerves such as in amputation of a limb, or occasionally after removal of a tooth, and in cases of great damage to a plexus or posterior root. The pain was persistent with exacerbations, and the painful phantom was felt to move with the stump. Dr. Riddoch explained the phenomena as a manifestation of the sensory function of projection—those aspects of sensation by which we recognized the constantly changing outline of our bodies and the relation of one part to another. The pain was due to structural changes in the nerves of the stump. Persistent pain lowered the patient's power of adaptation so that he could not learn to adjust himself to a new body shape, and this explained why painful phantoms persisted.

Dr. SCOTT (Penshurst) thought that not all the phenomena relating to phantom limbs were physiological in origin ; there was a psychological factor. This was shown by the occurrence of unreality feelings in relation to the body in psychoses and in delusions of multiple limbs in cases of depersonalization. Dr. T. S. GOOD (Oxford) pointed out that idiots often had no appreciation of pain. Professor W. E. LE GROS CLARK had demonstrated fibres connecting the thalamus with the pre-frontal lobe. Could changes be demonstrated in these fibres in such cases?

Dr. RIDDOCH, in reply, said that the parietal sensory cortex, which was the part of the brain concerned with spatial relations, was the only area affected in these cases. No phantom limbs developed after amputation in congenital or infantile cases. Psychological factors played a part, but the phantom limb was of organic origin, and quite a different matter from imaginings arising from functional or psychogenic causes.

SECTION OF OTO-RHINO-LARYNGOLOGY

Thursday, July 23rd

Otomicroscopy on the Living

With Mr. LIONEL COLLEDGE in the chair, Professor E. LÜSCHER (Berne) read a paper on otomicroscopy on the living. He had given the name otomicroscopy to the inspection of the living ear-drum under magnification to 10 to 50 times normal size. Thanks to the new ear microscope, this method of examination had become so simple that it could be used in clinical work and routine practice without particular difficulty. Apart from the recognition of a large number of hitherto unknown details, otoscopic appearances were more distinct, so that diagnosis became considerably refined. The lecturer gave a report of his ten years' experience of this technique and showed otomicroscopical pictures demonstrating that the blood vessels and their circulation could be studied in detail, and that by direct observation of the tendon of the stapedius muscle it was possible to show for the first time its reflectory protective action in hearing. The difficulties of the interpretation of the usual otoscopic observation was discussed on the basis of a picture of the jugular bulb projecting into the tympanum. Of especial differential diagnostic importance were, for instance, the otomicroscopical observations in mastoiditis, tuberculosis of the drum membrane, in cases where the epidermis grew in through peripheral perforations, and in the pathology of Shrapnell's membrane. By reason of the accuracy of observation the method was of special importance in forensic otology. In this manner, the author concluded, otomicroscopy was able to advance otology on the secure foundation of newly discovered facts. The interest of Professor Lüscher's communication was still further enhanced by a number of sketches of pathological conditions of the drum. In compliance to a request by the president, Professor Lüscher demonstrated with the help of a diagram the details and method of use of the otomicroscope.

Dr. T. B. JOBSON thought that this method of observation might throw some light on the development of cholesteatoma. The pictures of the attic perforations appeared to support the theory of those who believed that cholesteatoma was a new growth of epithelium from the middle ear—usually the attic—and not from the external auditory meatus. Occasional cases of cholesteatoma causing perforation from within outwards had been seen. Further observations with the otomicroscope would be of great value in solving this problem. Mr. E. D. D. DAVIS noted the remark made by Professor Lüscher that the normal drum was immobile, but called attention to the fact that respiratory movements could occasionally be seen. He welcomed the assistance given by otomicroscopy in tuberculosis of the middle ear, which was a condition often difficult to diagnose and, he thought, more often present than was supposed. He regretted the high cost of the instrument and hoped that before long the price would be reduced. Dr. T. A. CLARKE (Canterbury) said that when perforations through Shrapnell's membrane were inspected by means of the magnification provided by Siegle's speculum, they were often seen to possess sharp edges. He was interested to hear that such observations were not confirmed by otomicroscopy. Professor LÜSCHER, in reply to a question by Mr. Vlasto, said he had not yet been able to observe the appearance of the stapedius muscle in a case of facial palsy because the double conditions of facial palsy and large perforation had not presented themselves for his observation. In reply to Mr. Davis, he admitted that movement of the drum with respiration could occur ; his remarks merely referred to the drum in repose. He was convinced that the formation of cholesteatoma occurred from outside and not from within.

Hearing Tests and Aids to Hearing

Mr. G. E. MARTIN (Edinburgh) opened a discussion on this subject with the paper which appeared in the *Journal* of July 25th (p. 173). His main point was that no otologist was justified in sending away a deaf patient without discussing with him an aid to hearing, and to do so he himself must have a thorough knowledge of the various types of aids. The time had arrived when aids to hearing should not be haphazardly sold to the public, but should be supervised and each case tested on its own merits. There was a great need for clinics where patients hard of hearing might apply for advice. A paper on the same subject in the production of which Mr. Cleminson had collaborated was read by Dr. PHYLLIS M. KERRIDGE. They had found that accurate prescription of hearing aids from the results of hearing tests had rarely been achieved even in research laboratories. Nevertheless, rough consideration of the physical characteristics of hearing defects and of hearing aids yielded surprisingly good results ; probably this was because perfect hearing was a luxury. General rules were given as to the type of instrument most likely to suit any given case of deafness ; these depended not only on the degree and nature of the deafness, but also on sociological and psychological factors. Even senile deafness could be relieved, especially by a valve amplifier instrument with a crystal microphone. Mr. F. J. CLEMINSON reported a case of deafness caused by a bilateral mastoid operation where great improvement in the hearing had resulted from the insertion of artificial drums. The demonstration of audiometric records enhanced the value of his remarks. A lengthy discussion followed on these two papers. GENERAL BIRKETT (Montreal) said that it had been his experience that in cases where there was a severe loss of bone conduction electrical instruments were of little use. He kept in his consulting room pamphlets which had been issued under the auspices of the National Institute for the Deaf and handed them out to his deaf patients to give them guidance in what to do and what to avoid in the matter of aids to the hearing. He thought that it was a pity that artificial drums had fallen into disuse, because he felt that in suitable cases they were of great value.

Mr. R. SCOTT STEVENSON emphasized the importance of lip-reading as an artificial aid to the deaf. He called attention to the fact that the National Institute for the Deaf had classes in lip-reading at their headquarters in Gower Street, and the secretary would supply any practitioner with a list of competent teachers of lip-reading in most of the larger towns throughout the country. He contended that no deaf person who had become proficient in lip-reading required any other artificial aid. Dr. T. B. JOBSON suggested that the time had arrived when the supply of hearing aids should be in the hands of those who had special knowledge of hearing tests. Such individuals should be registered in the same manner as obtains in ophthalmological practice. The supply of spectacles and of hearing aids are on all fours and should be similarly treated. Dr. T. A. CLARKE (Canterbury) said that it would be extremely unfortunate if any suggestion of approval be given to the activities of sight-testing opticians, and it would be directly contrary to the policy of the Association. He appreciated that this would be an improvement on the present deplorable conditions, but that was not enough. He submitted that the public should have no access to the purchase of aids for the hearing without a medical prescription, and thus only could the present exploitation and abuse be lessened

Dr. Lishman (Oxford), Dr. Ritchie Rodger (Hull), and Dr. A. D. Sharp (Leeds) also spoke.

Dr. Martin in his reply agreed that it was better that we should be in the hands of centralized organizations than in the hands of individuals, and that it was the function of medical men to direct such organizations. He agreed with the experience of other speakers that whereas children learnt to lip-read with surprising ease, adults experienced the greatest difficulty in acquiring this art. Special classes had been started in Edinburgh for children who were unable to hear the conversational voice at ten feet distant with the eyes closed. Dr. Kerridge reaffirmed her opinion that elderly people with nerve deafness should not be denied the boon of better hearing by means of an electrical instrument of the valve amplifier type.

SECTION OF PHYSICAL MEDICINE

Thursday, July 23rd

Electrotherapy and its Future

With Dr. G. Cooper (Leeds), a Vice-President, in the chair, Dr. W. J. Turrell (Oxford), the President, read a paper on electrotherapy and its future.

It was a remarkable fact, he said, that electricity, which had made such tremendous advances in every other sphere of daily life, was comparatively neglected as a therapeutic agent. Nevertheless, no other form of treatment had a more definite physiological basis. Characterizing the fundamental action of electricity in therapeutics as a blow or impact, Dr. Turrell proceeded to describe the various forms in which it could be applied. Two forms of interrupted galvanic current were of considerable interest—namely, the Leduc current, which provided one of the most certain remedies for causalgia, and Lapicque's interrupted current, which was of special value in the treatment of Bell's palsy and infantile paralysis. Electricity could be applied in forms ranging from the most violent blow to the gentlest impact: it could induce chemical changes which modified the reaction of the whole body: it could set up polarization, orientation, and vibration of the molecules of the body at inconceivable frequency. He deprecated the fact that the therapeutic application of electricity was to a large extent in the hands of persons without a medical qualification. As a result of a lack of clinical knowledge their administrations were necessarily of a somewhat empirical character. It was also regrettable that the average medical practitioner possessed an inadequate knowledge of electrotherapeutics, and he suggested that this branch of medicine might with advantage be incorporated in the curriculum. With regard to the future the heavy cost of the necessary apparatus placed a financial burden on both doctor and patient, and only large clinics and hospital departments would be able to afford complete or even adequate equipment. Such institutions, under the supervision of whole-time salaried specialists, assisted by a number of technical experts, would provide treatment of maximum efficiency at minimum cost. In the past electrotherapeutics had suffered from prejudice, ignorance, and indifference, but increasing knowledge of nature's basic principles would be accompanied by increasing use of her most fundamental, potent, and readily controlled agent—namely, electricity.

Dr. E. P. Cumberbatch said that electricity had a role of its own in therapeutics, and that routine treatment should be conducted by trained administrators under medical supervision. The task of a medical specialist in electrotherapy would be fourfold: (1) to act as a liaison officer between physician or surgeon and the administrator of the treatment, advising as to type and suitability of method; (2) to practise such forms of electrical treatment as a masseuse could not be expected to perform; (3) to conduct investigations in his department; and (4) to teach his subject. Dr. Cumberbatch drew attention to the factors that were impeding the progress of electrotherapy and would thereby endanger its position in the future. These factors were the ancillary position of the medical specialist, the filling of his department with unsuitable clinical material, and the lack of attention on the part of medical students to electrotherapy. The result would be the stifling of the desire of the medical electrotherapist to conduct investigation, and an apathetic attitude on the part of the student when qualified. Unless these impeding factors were removed, the future would bring stagnation of medical electricity and the passing of electrotherapy into the hands of non-medical administrators.

Dr. G. B. Batten, speaking with the experience of fifty years' practice of electrotherapy, stated that in one district of Outer London only two out of some five hundred doctors had a thorough knowledge of this branch of medicine. There was an urgent demand for more practitioners conversant with electrotherapy and also for research. The resources of electrotherapeutic departments were strained by the attendance of large numbers of incurable cases to the detriment of those who might be permanently cured. Dr. Agnes Saville quoted an instance showing the perverted opinion of the lay public, which had come to regard electrotherapeutics as almost entirely within the sphere of non-medical administrators. Dr. King Brown stressed the importance of interesting general practitioners in electrotherapy. He also considered that the establishment of chairs of physical medicine in the universities would be beneficial. Dr. W. Kerr Russell pointed out that the general practitioner sometimes showed some reluctance in sending patients to specialists in electrotherapy, fearing that he would thus lose control of treatment. This difficulty did not occur when the electrical treatment ordered was administered by non-qualified persons.

Sir Francis Fremantle held that the future of this branch of medicine must depend largely on its place in the medical curriculum and qualifying examinations. The whole curriculum was now being revised by the General Medical Council, and whatever measures were introduced would probably affect a whole generation. It was therefore highly important that physical medicine should be included in the revised curriculum. With regard to future arrangements for this form of treatment under national health insurance great caution was necessary. If such treatment were allowed as additional benefit, there was a danger of patients being sent in large numbers to non-medical physiotherapists, and receiving inappropriate treatment with disappointing results. The value of physiotherapy might thus be fatally discredited. Possibly the wisest course would be the establishment of clinics comparable to the Red Cross Clinic for Rheumatism, Regent's Park.

Professor E. Weissenberg (Vienna), who showed a masterly command of English in an unprepared speech, described the conditions of electrotherapeutic practice in Austria. In that country treatment was never administered except under the supervision of fully qualified practitioners. Dr. A. B. Hirsh (New York) stated that in New York State legislation had been brought in to restrict the activities of unqualified electrotherapeutists. As a result about a thousand of them had migrated to other States. American medical electrotherapeutists were anxious that this branch of medicine should be included in the curriculum. Dr. J. A. Lister (Glasgow) presented the point of view of the general practitioner, who would welcome opportunities for increasing his knowledge of physical medicine. He alluded to the abuse of the facilities of electrotherapeutic clinics, designed for the poor, by people of means in some parts of Scotland. Dr. George Cooper (Leeds) stated that it was impossible for the electrotherapeutic specialist to avoid charging fees which were high in comparison with those ruling in non-medical clinics. Leeds University was progressive enough to provide courses in physical medicine for fourth and fifth year students.

Dr. Turrell, replying, regretted the absence of Lord Horder. It was the hope of all electrotherapeutists that the General Medical Council, in any revision of the curriculum, would consider the claims of this branch of medicine.

Physical Methods in Endocrinology

Dr. Turrell having resumed his place in the chair, Dr. A. P. Cawadias read a paper on physical methods of endocrinotherapy, which was published on August 1st (p. 215). Dr. A. Gordon Watson (Bath) said that Dr. Cawadias had opened up a new view of endocrinology. With regard to physical medicine at Bath satisfactory arrangements had been made to permit the poor to avail themselves of the best facilities of the Spa. Bath practitioners preferred a free hand with their cases, for the strongly radio-active waters did not suit all conditions. In early cases of rheumatoid arthritis, for example, rest, skin plaster splinting, and possibly ultra-violet rays, were usually preferable to bath treatment. Considerable advances had been made in selecting suitable cases for balneological treatment.

Dr. F. H. Humphris stated that the static breeze gave excellent results in the relief of adrenal insufficiency, producing a small but definite rise in blood pressure. Radium emanation in endocrinotherapy had the advantage of stimulating the male as well as the female gonads. Dr. C. H. Scott spoke of the difficulty in finding any satisfactory treatment for impotence in the male or amenorrhoea in the female. Dr. J. B. Burt (Bath) said that climatic therapy was of value in reducing excessive thyroid activity. Sir Francis Fremantle stressed the importance of a correct physiological basis of treatment. At present there was too much empiricism, which was to be deprecated.

Dr. Cawadias, in reply, said that the tendency of scientific workers to turn their faces to the guinea-pigs and their backs to the patients must be remedied. The basis required was a real physiology and pharmacology with human rather than animal reactions. The therapeutic value of mineral waters should not be underrated. Spa physicians were too much neglected in England. Their waters constituted a powerful remedial agent, of which they alone had the requisite special knowledge. It was important to treat the patient rather than the disease ; the constitutional formula of every case must be found.

COMBINED SECTIONS OF ANATOMY, PATHOLOGY, PHARMACOLOGY, AND PHYSIOLOGY

Thursday, July 23rd

Demonstrations

On Thursday, from 10 a.m. to 1 p.m. the following demonstrations were given in the scientific departments of the University. Professor J. H. Burn, assisted by some members of the staff of the pharmacological laboratories of the Pharmaceutical Society, showed: (1) the method of standardization of pituitary extract on the guinea-pig's uterus ; (2) the method of standardizing oestrin by the vaginal smears in the rat ; and (3) a method of standardizing cortin in the drake after removal of the suprarenal glands. Dr. K. J. Franklin (Oxford) showed his apparatus for amplifying and recording fine movements, the contracting tissue being made to tilt a small mirror which reflected a beam of light on to a recording drum covered with a sensitive bromide paper. Professor J. A. Gunn (Oxford) showed a contrivance for observing the movements of organisms like paramecia or trypanosomes by projection through the microscope on to a screen. He intended to show the movements of the exsected human vermiform appendix, but, no timely operation providing the necessary organ, the movements of the rabbit's appendix were demonstrated and a series of lantern slides were shown illustrating the action of drugs on the human uterus and appendix. Professor R. S. Heathcote (Cardiff) demonstrated the comparative toxicity of certain local anaesthetics on the perfused frog's heart. Dr. T. B. Heaton (Oxford) showed the action of ergometrine and pituitrin on the uterus of the cat *in situ* and on the blood pressure.

Dr. E. P. Poulton demonstrated his tent for the effective administration of oxygen to a patient in bed. In response to the criticism of an onlooker he showed that the tent has sufficient reserve to give an adequate supply of oxygen for two subjects in the one bed without any discomfort or distress or overheating. Dr. Argyll Campbell had on view a light portable box mask for giving oxygen effectively without elaborate preparation or waste of time. Dr. J. W. de W. G. Thornton (Bristol) demonstrated that desensitization can be accomplished without shock. Using the isolated lungs of guinea-pigs, which had been sensitized to egg albumen five to six weeks previously, and perfusing them by his own method, he showed: (1) that the bronchospasm which causes symptoms is a phenomenon separate from (and probably secondary to) the specific intracellular action of the desensitizing dose of antigen ; (2) that the bronchospasm can be completely controlled by previous dosage with adrenaline without impairing the desensitization ; and (3) that large doses of antigen can therefore be given within a short space of time sufficient to accomplish desensitization in one session, and without the symptoms previously thought to be an essential part of the process. Dr. H. L. Marriott and Dr. K. Robson completed the exhibition in oxygen administration by showing a nasal catheter held comfortably by a light frame round the brow of the patient.

Dr. Marriott and Dr. A Kekwick showed the simple character and the great advantages of an apparatus for the slow transfusion of large quantities of blood by the "drip" method. Dr. H. M. Carleton and Dr. E. G. T. Liddell (Oxford) exhibited cats in which the exteriorized artery was available for taking blood pressure. A meat diet produced a placid animal with a low blood pressure ; milk a hungry animal with a high blood pressure. Dr. J. C. Eccles and Mr. J. W. Magladery (Oxford) demonstrated the correlation of electrical and mechanical responses of smooth muscle (nictitating membrane of cat) using the cathode-ray oscillograph in an electrically screened room. Mr. D. P. C. Lloyd (Oxford) showed action potentials from the inferior mesenteric ganglion by means of the cathode-ray oscillograph, also in a screened room.

Dr. A. P. Meiklejohn (Oxford) demonstrated the use of Schopfer's test for estimating vitamin B_1 in blood. The test depends on the growth-promoting activity of the vitamin on a mould, *Phycomycetes*, and can be used to estimate amounts of the vitamin between 1 and 0.01γ. ($1\gamma = 0.000001$ gram.) Mr. J. R. O'Brien (Oxford) presented a film showing typical symptoms in rats fed on diets deficient in different components of the vitamin B complex.

Messrs. R. M. Ranson and J. Tynen, collaborators of Dr. J. R. Baker, working for the Birth Control Investigation Committee, demonstrated a technique for investigating the spermicidal efficiency of chemical contraceptives. Many of the chemical contraceptives on the market are below standard, and new spermicides are being sought, the future for which is distinctly hopeful.

Drs. K. Tansley, F. G. Spear, and A. Glücksmann exhibited microscopical sections and charts of the effects of gamma rays on the developing rat retina. The immediate effect was to stop cell division, which was resumed after periods that varied according to the strength of the radiation. This phase was followed by one of degeneration, and recovery might be associated with the formation of a new fibre layer and of rosettes.

Professor T. Nicol showed sections indicating varying reactions of the endometrium to intra-vitam dyes during phases of the oestrous cycle of the guinea-pig. The development of the carotid sinus was demonstrated by Dr. J. D. Boyd (Cambridge) by figures and sections, and Dr. F. Goldby (Cambridge) presented a series of specimens showing Marchi degeneration in the brain of the lizard following specific lesions.

Professor H. H. Woollard exhibited a series of enlarged photomicrographs demonstrating the cutaneous nerve endings to which he had referred in his paper of the previous day. Dr. J. Kirk provided an interesting series of photographs of the descent of the testis and the

influence exercised on this process by the gubernaculum. Dr. P. N. B. Odgers (Oxford) showed figures and slides of a early human embryo, and Dr. S. Zuckerman (Oxford) a series of charts summarizing experiments on the endocrine basis of the menstrual cycle.

Sections of the brain stained by Mulligan's method were exhibited by Dr. Green, and Dr. H. Grüneberg demonstrated an interesting series of specimens of mice presenting genetically determined skeletal deformations.

SECTION OF RADIOLOGY

Thursday, July 23rd

Diagnosis of Subacute Obstruction of Small Intestine

With Dr. J. F. Brailsford (Birmingham) in the chair, a paper was read by Dr. J. Duncan White on radiological diagnosis of subacute small bowel obstruction.

Dr. White referred to the large number of patients suffering from indigestion who were referred to the hospital radiologist. In many of these peptic ulcers were demonstrable; where no such lesion was discovered it was important to investigate the whole alimentary tract, in some part of which a lesion might be found. Investigation—often neglected—of the small bowel might reveal the cause of the dyspepsia. Abnormality was revealed when the typical "feathery" appearance of the small bowel was absent in some part, or when it was found that there was fixation of coils to the abdominal wall or to a neighbouring coil. Failure of a coil to alter in shape on massage was often significant. Vigorous peristalsis was, of course, an even more definite sign. The speaker showed many films illustrating varying degrees of obstruction in the small bowel in eleven cases. In five of these radiological diagnosis had been confirmed on subsequent laparotomy. The radiologist was not, he thought, justified in doing more than make a diagnosis of subacute intestinal obstruction. Peritoneal adhesions, after either laparotomy or tabes mesenterica, were the commonest causes, new growth being very rare. Where no peptic ulcer could be discovered and flatulence was a prominent symptom, some degree of intestinal obstruction should be suspected. Diagnosis should be made by careful correlation of radiological with clinical findings.

Dr. J. F. Brailsford suggested that valuable information as to site of obstruction might be obtained by radiological investigation of acute cases. Mr. R. L. Newell (Manchester) said that the subject was interesting from the point of view of the surgeon, and radiological investigation in these cases was in the best interests of the patient. Early carcinoma in the caecal area was difficult to diagnose. Dr. L. A. Rowden (Leeds) thought that the explanation of the cascade stomach seen in some of Dr. White's films was that the stomach rested on a distended colic flexure. He agreed that most patients with subacute intestinal obstruction had had previous laparotomy. Dr. N. S. Finzi referred to an obscure condition of the lower ileum, in which there was ulceration and enlargement of Peyer's patches and of associated glands. He would be glad of an opinion as to diagnosis.

Dr. Duncan White, in reply to Dr. Finzi, said that such a condition might eventually give rise to stenosis and a mild degree of obstruction. Typhoid fever was a possible cause, but he would be chary of giving a diagnosis in such a case. The radiologist was too often asked to investigate the stomach and duodenum only, in cases of chronic dyspepsia. This was wrong, and in his opinion the whole tract should be investigated.

X-Ray Therapy in Deep-seated Malignancy

A discussion on *x*-ray therapy in deep-seated malignancy was opened by Dr. J. Struthers Fulton (Glasgow) with a paper on *x*-ray therapy in carcinoma of the lung. There was evidence, he said, that the incidence of primary carcinoma of the lung was increasing—the disease constituted 5 to 10 per cent. of all carcinomata. Choice of treatment lay between surgery and irradiation. Very few cases were suitable for surgical treatment, and the mortality was 30 to 50 per cent. Better results were obtained by irradiation, and symptomatic relief was often very great. After reviewing the results of a series of thirty-one cases treated at the Western Infirmary, Glasgow, the speaker said it was now generally believed that prolongation of the time factor in *x*-ray therapy gave better results. There was little doubt that radical treatment must be given as a single continuous course of radiation. If it failed there could be no second attempt, because of the danger of severe lung injury. The treatment field must be homogeneous, and must include the whole area of malignancy and the neighbouring mediastinum. In cases where the malignant area was very large treatment might have such dire effects on the patient as to make it unjustifiable. He thought that 6,000 *r* should be delivered to these tumours, and he himself used five fields. By irradiating all the skin fields on each day of treatment greater skin tolerance was assured. In cases where palliation only was desired treatment should be confined to five days, and only a mild erythema should be produced. Only those cases in which the patient had no debility or loss of weight, and in which the lesion was limited in extent, should be regarded as capable of withstanding radical treatment. Dr. Fulton showed several films of carcinoma of the lung before and after treatment.

Dr. Finzi said that whereas bronchial carcinoma usually caused collapse of the lung, mediastinal carcinoma very rarely did. He thought that one of Dr. Fulton's films looked more like sarcoma. Bronchial carcinoma gave rise to metastases very rarely, and treatment should be started as soon as a tumour was discovered, without wasting time on bronchoscopy, which he was sure hastened metastasis. The danger of infection of the lung after large *x*-ray doses was very real. Palliative treatment was worth while for the relief of the chest condition, but it often prolonged the patient's life only to ensure that he died from painful bony metastasis. Irradiation of the mediastinum was important, as was careful localization of the skin fields. As the lung expanded during treatment the tumour was liable to change its position. Dr. Finzi showed several films to illustrate cases he had treated.

Dr. J. E. A. Lynham said that a primary difficulty about these cases was that of diagnosis. In very early cases he thought lobectomy or radon seeds were the methods of choice. In rapidly growing tumours he agreed that intensive radiation up to 6,000 *r* in six weeks should be given, but in those which grew more slowly, such as secondary carcinoma of the breast, treatment should be given more slowly. Artificial pneumothorax maintained throughout treatment might be helpful.

Dr. W. Levitt agreed with Dr. Fulton's classification of cases as regards treatment. It was useless to attempt to treat the advanced case. Dr. Finzi's cases were encouraging, as were Dr. Fulton's, but good results were seldom seen, largely because the lung was badly damaged by treatment, and the patient was liable to succumb from subsequent infection. Dr. J. F. Bromley (Birmingham) said that he was impressed with the importance of exact diagnosis, and agreed that metastases took place early. The relief of pain after treatment of bone metastases was sometimes well marked. Dr. J. Duncan White quoted a case of bronchial carcinoma in which cerebral metastasis had taken place during treatment, and asked Dr. Fulton whether he thought *x*-ray therapy ever hastened metastasis. Dr. L. Buckley (Bournemouth) asked whether Dr. Fulton used any special skin application during and after treatment. Dr. F. G. Greenwood (Blackpool) said that despite, and to some extent because of, what he had heard during the discussion he doubted whether it was justifiable to treat these cases at all. He thought that the most it could do was to preserve patients to meet a hideous death from bony metastasis. Dr. Brailsford said that he was rather in sympathy with the last speaker, and he thought it difficult to be sure that irradiation prolonged life.

Dr. Fulton, in reply, said that as regards palliation he thought that relief of the distressing dyspnoea was well worth while. The pain from metastasis in bone could be relieved by morphine. He did not agree that treatment by radon seeds was a good method. In tumours which

rapidly subsided during treatment he thought there was danger of the treatment causing metastases. He had used infra-red rays on the skin in an attempt to reduce reactions. He agreed with Dr. Greenwood that the results were depressing, but thought that radiologists should persevere with the only method of treatment available.

X-Ray Treatment of the Pituitary

Dr. J. F. Bromley (Birmingham) read a paper on the *x*-ray treatment of basophil pituitary hyperplasia. Basophil pituitary hyperplasia, he said, gave rise to a polyglandular syndrome, which occurred for the most part in young adults. The features included sexual dystrophy, hypertrichosis of the face and trunk, rapidly increasing adiposity, with a dusky appearance of the skin. The blood pressure was usually high, and hyperglycaemia sometimes occurred. Dr. Bromley then described seven cases treated by *x*-ray therapy, in all of which there had been definite improvement. In most of the patients the symptoms and signs had entirely disappeared as a result of treatment. In all the cases 200 kV constant tension was employed, with a filter of 1.5 mm. copper plus 0.5 mm. aluminium and 40 cm. anticathode skin distance. Dosage was usually 1,500 to 2,000 *r*, delivered in fourteen sessions over periods from three to six weeks. Improvement usually occurred at once, but in two cases there was some delay, and treatment was repeated. As a rule, the more acute the onset the more immediately successful treatment proved to be. The condition was a distressing one, and the success attending radiation therapy was often striking.

SECTION OF ORTHOPAEDICS

Thursday, July 23rd

Treatment of Spinal Cord and Nerve Root Lesions

With Mr. G. R. Girdlestone, President of the Section, in the chair, a discussion on the treatment of spinal cord and nerve root lesions, the results of trauma, was opened by Mr. Geoffrey Jefferson (Manchester).

Mr. Jefferson said that much of his own enlightenment on the pathology of cord injuries had come from following the investigations of the Oxford school. Evidence was produced showing that haemorrhage (haematomyelia) was not the predominant feature in the causation of cord damage. Oedema or almost instantaneous necrosis was the rule. This was followed by a survey of the main features in prognosis and treatment.

Dr. C. P. Symonds said that in the case of nerve fibres in the cord there was a wide margin between physiological interruption and irreparable damage. With nerve cells this was not so, which accounted for the residual atrophy sometimes seen in the upper limb in cases of cervical damage where recovery in the lower limbs was complete—that is, the pyramidal tracts had recovered but not the cervical anterior horn cells. He agreed with the opener that this and other clinical phenomena could not be attributed to haematomyelia. It was still believed by some that injury could damage the cord indirectly, but recent improvement in stereoscopic radiography and careful post-mortem examinations had shown that dislocation or fracture was almost invariably present, although the post-traumatic rebound might be so complete that the evidence of skeletal damage was sometimes scanty, even in a grave cord injury. A persistence of cord compression after the initial injury had not been demonstrated (subarachnoid block) in any of his cases, and it followed, therefore, that manipulative reduction or open operation was not a matter of urgency so far as the cord was concerned. Early active treatment might, in fact, turn the scale against recovery. The prognosis in cord injuries usually became apparent within two to three weeks. In the case of injuries of the cauda equina the outlook was often uncertain after even six weeks' observation. Improvement might continue slowly over a period of two years.

Before reduction of a fracture was undertaken the following points called for consideration: persistence of the compression was exceptional, and further damage to the cord, as a result of treatment, must be avoided; a plaster jacket was positively dangerous in any case with involvement of the accessory muscles of respiration, and, still more, when the lesion was above the origin of the phrenic nerves; lastly, the application of plaster over anaesthetic areas sometimes led to the formation of serious trophic sores. In some cases it was even necessary to postpone *x*-ray examination for fear of damaging the cord further by moving the patient. Dr. Symonds considered urinary infection a real menace to life. The ideal treatment for retention was catheterization, at first six-hourly, then less frequently as control returned; but it should be continued at intervals of not more than twenty-four hours until the residual urine had fallen to about four ounces. Outside hospital, an indwelling catheter changed about every three days was probably safer, though more likely to set up a urethritis.

Mr. G. R. Girdlestone (Oxford) agreed that there was no urgency in the wedge crushes so frequently seen at the thoraco-lumbar junction, but the pain in cervical cases was often so severe that early reduction of the deformity was imperative. Gradual reduction by traction was to be preferred.

Mr. Watson Jones (Liverpool) was most depressed about thoracic cord injuries. He had never seen a single case of recovery, even after the most careful reduction. He drew attention to certain advantages of early reduction and fixation of the fracture which partially offset the disadvantages mentioned by Dr. Symonds. Further injury to the cord was prevented by the complete fixation of the fracture; pain could be relieved almost completely, and the patient could be turned in bed with safety.

Dr. H. Crawford (Brisbane) also favoured early reduction of the fracture except in the most severe cases. Mr. Naughton Dunn (Birmingham) asked if brachial root injuries could accompany cervical spinal injuries, and if so was operative treatment of any value?

Mr. Jefferson, in closing, said that, although he was not entirely against early reduction, he thought orthopaedic surgeons should pause more often to ask how much good—or harm—they might do by active intervention. His answer to Mr. Dunn's first inquiry was in the affirmative, but he thought that operative treatment was useless.

Dr. Symonds was unconvinced by Mr. Watson Jones's advocacy of early reduction, but was prepared to change his mind if the latter would produce clear evidence of compression of the cord present before, and relieved by, reduction of the fracture.

Uses and Abuses of Manipulative Surgery

Mr. A. S. Blundell Bankart opened a discussion on the uses and abuses of manipulative surgery. He said he had come to the conclusion that all that a bone-setter could do to a painful joint was move it, and success depended upon the attainment of full movement in a joint or set of joints handicapped by the presence of adhesions. The principles of manipulative treatment were exceedingly simple, though not always easy to apply. Foot strain, spinal conditions, and the knee-joint were then considered and, in conclusion, Mr. Blundell Bankart traced the history of osteopathy and chiropractic, pointing out the consistent absence of anything approaching a scientific basis for the forms of manipulation covered by those terms.

Mr. A. G. Timbrell Fisher thought that Mr. Bankart had made manipulative surgery appear dangerously easy, and that abuse might bring this valuable form of treatment into disrepute. Mr. Watson Jones (Liverpool) emphasized the value of active exercises after manipulation, and the avoidance of passive stretching of the joint by a masseuse.

The discussion was continued by Dr. R. G. Abercrombie (Sheffield), Mr. H. O. Clarke (Manchester), and Miss Forrester-Brown (Bath). In his reply, Mr. Bankart said that while the principles of manipulative surgery were simple, the actual manipulations might in some cases be far from easy.

SECTION OF PATHOLOGY AND BACTERIOLOGY

Thursday, July 23rd

Disorders of Haematopoiesis Due to Toxic Substances

The second day's proceedings began with a discussion on disorders of haematopoiesis due to toxic substances, opened by Professor L. J. WITTS with the paper which appeared in last week's *Journal* (p. 211).

Dr. J. C. BRIDGE said he had seen the first cases of chronic benzol poisoning occurring in industry and recorded in this country. Out of seven workers employed in the particular process, all of whom were exposed to the same risk, only two were affected, and both died. Susceptibility naturally raised a big industrial issue, because it meant that the toxic concentration in air of a volatile body such as benzol might have to be considered in relation to any possible susceptible person. During the last fifteen to twenty years the number of complex volatile substances used in industry and to which workers were exposed had increased vastly. Idiosyncrasy and susceptibility of human beings appeared to justify his apprehension as to the reliability of animal experiments in estimating the toxicity of these bodies to man. The difficulty of correlating exposure concentration of volatile bodies under industrial conditions was very great, and, unlike certain drugs, no definite dosage could be estimated. Since 1926 chronic benzol poisoning occurring in a factory or workshop had been compulsorily notifiable under Section 73 of the Factory and Workshops Act to the Chief Inspector of Factories, and from 1926 to the end of 1935 there have been seven cases so reported. All of these had anaemia of aplastic type—five were males and two females. The blood of a number of workers exposed to benzol had been examined by his colleague Dr. Sybil Horner.

In interpreting the results one came up at once against the problem as to what was, in fact, a deviation from the blood count normal to the individual. In 52.4 per cent. of this group of benzol workers examined a red cell count of 4.8 to 5 millions was found, while 45.2 per cent. had a count of 3 to 4.8 millions; only 2.4 per cent. had a count in excess of 5 millions. The red blood cells were normal in appearance in 68.3 per cent. of the cases examined. No evidence of leucopenia was found in 74.7 per cent. of cases examined; 24.2 per cent. had a white cell count of 4,050 to 6,500, while 1.1 per cent. were below 3,500. On the differential leucocyte count 53.9 per cent. showed no relative lymphocytosis; 45.7 per cent. had lymphocyte percentages of 31 to 51.

Dr. Panton in 1917 had reported on thirty-four cases of sickness among workers exposed to T.N.T., and found six cases of anaemia of aplastic type—a very small proportion of the number exposed to risk, particularly when one considered the number who were not suffering at that time from any form of illness. The toxic effect of T.N.T. was predominantly a condition known as toxic jaundice; yet in a few cases this form of anaemia was present with the jaundice. In experimental work on animals as to the toxic effects of the volatile solvents—for example, carbon tetrachloride—changes in the liver and in the kidneys had been found; one therefore wondered whether the blood-forming organs might not also be attacked in certain workers exposed to this and similar bodies. In this country the use of a radioactive substance for painting watch dials was limited, but in view of the serious effects noted in America some years ago a survey of all such workers as could be found was carried out. These had been subsequently followed up, and a recent blood examination of a group of workers by Dr. Horner did not reveal any change suggestive of anaemia. The variations in the form of anaemia caused by toxic substances made Dr. Bridge a little doubtful whether we had a true knowledge of all cases of anaemia due to a toxic substance occurring in industry; for it must be confessed that in the diagnosis of chronic benzol poisoning, for example, stress had been laid on the presence of an anaemia of aplastic type. Professor Witts had mentioned leukaemia, and this called to mind two cases of this condition, in neither of which was there any industrial history of an association with benzol. In conclusion, it seemed to Dr. Bridge that in cases of anaemia of doubtful origin and in which a toxic element was suggested a possible cause should be most carefully sought for in the industrial occupation. In this direction he assured Professor Witts and all those interested that the Factory Department of the Home Office will be only too willing to assist.

Dr. L. E. H. WHITBY gave illustrations of the effect of radium and *x* rays on the blood of people employed in administering these rays to patients. The cases were derived from an analysis of the records of the Middlesex Hospital for the past ten years, where control of employees took the form of a complete blood count every three months and, for the past five years, an initial control count, or counts, before work is begun. During this ten-year period there was one fatality, a case of acute leukaemia (*Lancet*, 1927, i, 1279) in a medical man who had been working with *x* rays for ten years. Opinion was still divided as to whether this disease could be attributed to the occupation. The commonest earliest changes in the peripheral blood of *x*-ray and radium workers were leucopenia and neutropenia. These were followed later by lymphopenia, and still later by definite reduction in the red cells and haemoglobin of an aplastic or hypoplastic type. The safety rule adopted at the Middlesex Hospital was that any person with a total leucocyte count of less than 5,000 per c.mm. or a total polymorphonuclear count of less than 3,000 per c.mm. must be given a rest from *x*-ray or radium work.

The importance of this rule was illustrated by a specific case where, after working with radium for two years without any ill effect, a slight leucopenia and neutropenia were neglected and work was continued for three months. During the next four months, though not working, the leucopenia, neutropenia, and lymphopenia persisted and a definite anaemia developed. The condition took altogether six months to recover from. A similar case was quoted of a doctor working with a 1 gram radium bomb. Here the first sign was a neutropenia; this again progressed after ceasing work, but had entirely recovered in six weeks.

It had been found that persons with a normal count which tended to be leucopenic were unsuitable for employment in *x*-ray and radium departments. The natural leucopenia quickly became a dangerous one (seven cases). Some persons were unduly sensitive to rays and quickly became leucopenic even though the natural count was normal (four cases). The radium worker was more exposed to danger than the *x*-ray worker, for the records showed ten cases of trouble in the radium department and only three with *x* rays; of these three, two were working with deep *x* rays.

Dr. S. C. DYKE (Wolverhampton) spoke of the relation of agranulocytosis to amidopyrine. Agranulocytosis was first recognized by Schultze in 1922, and thereafter became increasingly common. The main incidence was in America, Germany, and Denmark; it had remained relatively rare in this country. The aetiology remained obscure until in 1931 Steelhorn and Amolsch drew attention to the fact that it showed a peculiar affinity for medical men and women and those associated with medical work. Searching for a factor common to those associated with the medical profession and more intense in its incidence in America, Germany, and Denmark than in this country, both Kracke and Parker and Madison and Squier in 1934 independently found their attention directed to the newer hypnotic and analgesic drugs put on the market since the war largely as the result of the work of German chemists. Both these couples of workers found a history of the ingestion of amidopyrine either alone or in combination with some other drug before the onset of the agranulocytosis. Various observers had shown that in sensitive subjects amidopyrine could induce the agranulocytic state, and there now appeared to be no room for doubt as to the aetiological relationship. The speaker recorded three cases of his own, following on the use of veramon, novalgin, and allonal respectively. Two proved fatal; the third patient recovered spontaneously. Dr. Dyke had found pentnucleotide of no use in this type of case. The condition always appeared in persons past the prime of life, and susceptibility seemed to be related in some way to a change or failure of balance in the sex hormones. Cases had been recorded

in which agranulocytosis recurred with every menstrual period. With this in view cases had lately been treated with antuitrin-S and other ovarian hormones, with promising results. The speaker pointed out that amidopyrine consisted of a substituted pyrazolone ring attached to a benzene ring. The benzene ring occurred in many harmless drugs, such as aspirin and phenacetin, and could not be regarded as responsible for the noxious action of amidopyrine in sensitive subjects. The mere combination of benzene and pyrazolone rings, as in antipyrine, seemed in itself harmless; substitution in the pyrazolone ring appeared to endow it with the objectionable properties.

Dr. Janet Vaughan discussed the disorders of haematopoiesis due to toxic substances produced within the body to a large extent—namely, the blood dyscrasias associated with sepsis and azotaemia. She suggested that since these conditions were relatively common their study might be easily undertaken. It was often stated that the anaemia associated with chronic sepsis was dependent upon bone marrow aplasia. Such reports in the literature as she had found suggested rather that there was a hyperplasia of erythropoietic tissue. She wondered, therefore, if sepsis might not be associated with maturation arrest of the marrow. There was no evidence except in rare conditions, like Oroya fever and *B. welchii* infections, that sepsis caused increased blood destruction. Such evidence as was available suggested that it inhibited erythropoiesis. In support of this Dr. Vaughan quoted the well-known clinical fact that haematopoietic principles lost their therapeutic effects in the face of sepsis and the observations of Fairley that removal of the parasite alone in the anaemia of malaria was sufficient to promote blood production. Experimental work by Robscheit-Robbins and Whipple, she thought, had shown that this inhibitory action of sepsis was exerted neither on the marrow nor on the peripheral blood, but on the internal metabolism of haemoglobin. Whether the changes in the marrow in agranulocytosis of sepsis were similar to those occurring in amidopyrine poisoning seemed to be still a matter of question. Probably in sepsis myeloid degeneration was more marked, while in amidopyrine poisoning nodules of lymphocytic proliferation appeared characteristic. She emphasized the importance of never taking a patient's or a doctor's word that amidopyrine had not been ingested, and instanced a case in which the drug had been isolated from the urine during life and from the liver at necropsy in a typical case of agranulocytosis. On analysis of all drugs the patient had taken, amidopyrine was found in a bottle of tablets labelled "yeast." Certain cases of thrombocytopenic purpura appeared to be due also to the presence of sepsis. Discussing the anaemia associated with azotaemia Dr. Vaughan described five patients who, irrespective of their red cell count, had shown a reticulocytosis varying from 3.6 to 14 per cent. Three of these cases at necropsy had proved to have rather less marrow than normal in the skeleton. In conclusion she emphasized the importance of assessing the quantity as well as the quality of the marrow in all disorders of haematopoiesis.

Dr. J. V. J. Duhig (Brisbane) made some observations on lead poisoning. Dr. E. W. Ainley Walker (president of the Section) referred to experiments conducted by him and the late Professor Dreyer on the relation between blood volume and surface area. Dr. Lane, Professor W. Campbell (Capetown), and Dr. F. P. Mackie also contributed to the discussion.

Professor D. F. Cappell (Dundee) contributed a paper on pubertas praecox, and the members thereafter attended demonstrations jointly with the Sections of Physiology, Anatomy, and Pharmacology.

The Scientific Association of Paediatrists of Leningrad recently celebrated the fiftieth anniversary of its foundation in 1885, when there were only sixty-three paediatrists in the whole of Russia. Leningrad has now six children's hospitals, seven clinics for children's diseases, twenty-six consultation centres, and two institutes for the training of paediatrists.

Nova et Vetera

THE AMERICAN MEDICINE MAN

The Medicine Man of the American Indian and his Cultural Background[1] will be read with interest and profit by the doctor, the accoucheur, the anthropologist, the druggist, and the student of folklore. Dr. W. T. Corlett became interested in the medicine man in 1879 when he was stationed among the Ojibway Indians in Northern Canada, and, throughout his long life, has taken every opportunity of adding to his knowledge. His information, therefore, has been gained largely at first hand, though he has not neglected other sources, and is here set forth at large. He uses the general term "shaman" to denote the American medicine man, and traces his habits and customs from Alaska to Tierra del Fuego. The story is very complete, and it is well that it should be told before it is lost by the introduction of Caucasian medicine and becomes merely of historical interest.

Ceremonies and Practices

Dr. Corlett tells of the initiation ceremonies and of the different practices in the various tribes scattered over the enormous distances of North and South America. The individual methods vary, but the underlying principle appears to be identical from the extreme north to the farthest south. The shaman works by means of an appropriate song and a dance, putting both himself and his patient into a state of great excitement. Some shamans are then able to suck out the disease, others to cast out the devil causing it, others again to recall the soul which has wandered out of the body. The ethical standards vary as greatly among the shamans as they do among our own profession. The medicine men in some tribes have organized themselves into regular societies, the members of which call each other into consultation; in others the treatment is an obvious fraud, depending upon ventriloquism and sleight of hand. But the lower-class shaman does not enjoy a long life. In many tribes it is necessary that he should do his cures when he is drunk or under the influence of drugs; in others the death of one or two patients in succession leads to his being himself killed in the belief that he is giving poison instead of good medicine. Dr. Corlett says: "It is interesting to note that the theory of disease-cause which is most universal and popular in the New World is that sickness is due to the presence in the body of some foreign object, such as a fishbone, a stick, a stone, or a bit of hair." After that the following causes of illness, given in descending order of their importance, are soullessness, sorcery, spirit intrusion, and finally breach of taboo.

The account of child-bearing among the tribes is very full, and the author believes that although parturition as a rule is a mere physiological act, in many tribes there are many pitfalls attending it. The perils to mother and child are great owing to the observance of time-honoured customs, and there is a considerable mortality.

An article on foods and on the materia medica of the Indian ends a valuable work, which is provided with an excellent hand list of books for further study. There are also some well-reproduced portraits of the best shamans, which show them as thoughtful and handsome men, who might well pass for the highest class of our own profession had they been dressed in European clothes.

It may be noted that on page 227 the publishers have fallen into a practice which is becoming somewhat prevalent. Allusion is there made to an illustration on the paper jacket of the book which is not reproduced in the text. The jacket, of course, soon becomes destroyed or lost, and the reference is then merely irritating. In all such cases the block should be reproduced in the text or the reference to it should be omitted.

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[1] *The Medicine Man of the American Indian and His Cultural Background.* By William Thomas Corlett, M.D., L.R.C.P. Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. (Pp. 369; 23 plates. 22s. 6d.)

INTERNATIONAL CONGRESS OF MICROBIOLOGY

A SUCCESSFUL LONDON MEETING

The second International Congress of Microbiology, the opening sessions of which were reported in our last issue (p. 253), sustained its interest at a high level until its conclusion on August 1st. At a final plenary meeting it was decided to accept an invitation from microbiologists of the United States to hold the next congress in some city on the Atlantic seaboard, probably in 1939. Professor J. C. G. LEDINGHAM, the president, said in a closing address that the attendance at the various Sections throughout the week had sufficiently testified to the general interest of the problems discussed. The congress had brought together a very large proportion of the active workers in all the fields of microbiology, and many of them had related their first-hand experiences. A vote of thanks to Professor Ledingham for his outstanding services as president was moved by Professor JULES BORDET of Brussels and enthusiastically carried.

It was decided at this final meeting that the International Society for Microbiology, whose only task it had been to secure the continuity of the congresses, should be dissolved and replaced by an International Association of Microbiologists, which, unlike the society, would not have personal membership, but within which the existing national committees should in future function as national groups, each group appointing one member to act on a permanent international commission for the organization of the congresses.

Viruses and New Growths

One of the most animated discussions of the congress took place in the Section devoted to viruses and virus diseases. It was opened by Dr. PEYTON ROUS of New York, who described it as a "near possibility" that an association of viruses with cells was responsible for some of the neoplastic diseases; actually a tumour of the frog and numerous tumours of the domestic fowl had proved to be due to viruses. Where and how the causative viruses existed when not producing neoplasms was problematical, but it was known of some other viruses that they rested in the body and only exceptionally caused disease. Evidence that viruses could give rise to tumours in mammals was not wanting. The wild rabbits in the mid-west of North America frequently carried on their skin papillomas caused by a virus, and these growths, though manifestly infectious (as tumours were not under ordinary conditions), exhibited the immediate traits characterizing tumours as a class. In domestic rabbits the virus produced notably vigorous papillomas, which often became true metastasizing tumours. The discovery that the virus could cause a tissue disturbance out of which cancer arose had little importance in itself, for many, highly various, agents were carcinogenic in this way. But the rabbit virus produced papillomas that were themselves often on the brink of malignancy, resembling the papillomas of undetermined cause occurring in other species, and undergoing the same changes as did these latter when they became cancerous. Dr. Rous's conclusion was that viruses were the most direct causes of tumours now known, and the only agencies that brought them about, continued to actuate them, and determined their character and course. All tumour phenomena could readily be explained in terms of what was known of viruses, and yet it did not follow that the generality of tumours were actually caused by these agents.

A dozen speakers followed Dr. Rous. Two French workers, Drs. OBERLING and GUÉRIN, spoke of the coexistence of leucosis and malignant tumours in fowls, and discussed the evidence for the mutation of viruses. Dr. E. UHL and other workers from Copenhagen described neutralization with duck serum and leucotic plasma or leucotic chicken blood. The serum from normal untreated ducks did not neutralize the leucotic agent in chicken blood, but the blood serum of ducks immunized with leucotic chicken blood contained "antibodies" against such agent. Dr. F. R. PEACOCK summarized some work in the research department of the Glasgow Royal Cancer Hospital which suggested that filterable and non-filterable fowl sarcomata of similar histology probably existed, and contamination of a non-filterable tumour by a filterable agent might cause no recognizable change in the histology of the strain. Professor J. MCINTOSH said that biochemical investigations had failed to show any constant difference in the metabolism of the filterable and non-filterable tar-induced tumours. Dr. C. H. ANDREWES said it could be shown that a virus was not only the essential agent in the aetiology of filterable neoplasms, but it was also concerned in, at any rate, some non-filterable tumours. He mentioned results which, he said, implied that a virus might be concerned in the aetiology of a tumour which had been started off by tar; also that it was not to be concluded from the fact that a tumour was non-filterable that a virus was not concerned in its aetiology. The role of the tar was only to initiate the malignant process.

A short passage occurred between Dr. ANDREWES and Dr. W. E. GYE on the one hand and Dr. T. M. RIVERS of New York, the discoverer of virus III infections in rabbits, on the other, Dr. Rivers contending that the virus might not be causing the tumour, but be merely a passenger. Dr. ANDREWES replied that in the case of chemical tumours induced in animals the initiating agent—the chemical—was known, but it was not known what made the tumour go on. In the case of a naturally occurring tumour in the fowl it was known what kept it going, but not what started it. In the Sheffield tar sarcoma of Mellanby, however, very suggestive evidence was afforded that here in one and the same instance was to be found the initiating agent and the agent which kept the tumour going. Cells from this fowl tumour (the Sheffield tar sarcoma) inoculated into pheasants grew for a week or two, but ultimately always regressed, and such pheasants developed antibodies which neutralized Rous sarcoma virus. The deduction was that this non-filterable fowl tar sarcoma contained a virus closely related serologically to the Rous, but not directly demonstrable by filtration of the tumour. Dr. RIVERS said that he had gained the impression that certain workers wanted to explain all phenomena in one way. His own view was that a non-filterable tumour might be caused by a virus and another similar tumour might not be so caused. The discussion was summed up by Dr. PEYTON ROUS in the words, "We have to go softly in this matter."

Mechanism of Virus Immunity

Professor J. C. G. LEDINGHAM opened a discussion on this subject. A consideration of all the recent work, he said, pointed to the conclusion that genuinely killed virus agents, whatever the lethal method employed conferred only the most trivial and ephemeral protection, though even such might be useful as a basis for subsequent safe reinforcement by the living virus. The interest was now rightly concentrated on the study of the elementary bodies, admittedly the sole effective agents in all virus diseases, and the opportunity was offered for the investigation of their antigenic constitution. The resistance-producing properties of killed bacteria were only now becoming more thoroughly understood as more was learned of their constituent antigens. He invited discussion on the probable mechanism of action *in vivo* of the neutralizing or antiviral body elaborated in the course of, or in convalescence from, virus disease. Information was as yet scanty on one vital point—namely, the persistence of virus in the body after clinical recovery. Dr. E. W. SCHULTZ of Los Angeles followed with an account of some experimental work on prophylaxis in poliomyelitis. It had now been established, he said, that poliomyelitis was caused by a virus which normally entered the central nervous system by the olfactory nerve. The results of serum prophylaxis and the application of vaccines did not argue clearly for their effectiveness in controlling the disease, but recent observations indicated that temporary protection might be afforded by the previous treatment of the nasal mucosa with chemical agents which tended to diminish the permeability of the olfactory portal for this virus.

Immunization against yellow fever was discussed by Dr. G. M. FINDLAY, who said that more than a thousand persons had now been immunized against yellow fever by injections of immune serum and living virus. With the use of serum from immunized horses serum reactions occurred in from 10 to 15 per cent. of those injected, but with human serum from persons artificially immunized or recovered from natural infections no serious reaction had occurred among 200 persons. Since a method of immunization had been developed, no case of yellow fever had occurred among those exposed to laboratory infections.

Serological and Cultural Types

The Brucella group of organisms figured largely in the discussion on pathogenic bacteria. Professor G. S. WILSON gave a classification of the group based on antigenic structure and metabolic characteristics, and Drs. WILLIAM CAMPBELL and E. C. GREENFIELD of Capetown, in an account of the incidence of undulant fever in cases of pyrexia of uncertain origin, stated that the varieties isolated from human patients in the Cape Province had been *Br. abortus*, bovine, *Br. melitensis*, and strains with characters intermediate between these two varieties. Of 661 patients with pyrexia of uncertain origin, in whom malaria, typhoid and paratyphoid fever, influenza, ordinary pyogenic infections, and tuberculosis had been excluded, 4.84 per cent. gave serum reactions to a titre of 1 in 400 with one or other of three specified strains of Brucella, and 9.37 per cent. to a titre of 1 in 100; from which they concluded that 4.84 per cent. of such patients certainly, and 9.37 per cent. almost certainly, had been cases of infection with some variety of Brucella or were such at the time of investigation.

Professor J. W. MCLEOD of Leeds summarized the observations made during the last four years in many towns in the British Isles and Germany on the clinical significance of the three principal and well-defined cultural types of the diphtheria bacillus. Out of a total of 5,794 cases, 2,313 were of the "gravis" type (17 per cent. with paralysis and 13 per cent. fatal); 1,993 of the "intermediate" type (9.9 per cent. with paralysis and 8.6 per cent. fatal), and 1,488 of the "mitis" type (4.5 per cent. with paralysis and 2.3 per cent. fatal). The "gravis" form was distinctly associated with epidemic diphtheria, and the "mitis" form with sporadic. The interest of the investigation turned on the extent to which these types were stable. Were there three diphtherias due to different bacteria with slightly different but overlapping clinical manifestations, or was there a continuous fluctuation from type to type, of which one was more formidable to-day and another to-morrow?

Some observations made in Edinburgh were brought forward by Dr. HELEN WRIGHT and Dr. MAY CHRISTISON. During the years 1932–5 50 to 60 per cent. of strains isolated from swabs sent in for routine examination were "intermediate," and 15 to 20 per cent. were "mitis"; the "gravis" type was almost never encountered. The remainder did not conform to these types, and were classified as avirulent starch-fermenting or virulent or avirulent non-starch-fermenting. Throughout the period of investigation the diphtheria case incidence had been exceedingly low in the Edinburgh area and the case mortality slight. Recently there had been a sudden increase in the virulent non-starch-fermenting type, and the question arose as to its epidemiological significance.

Dysentery and Botulism

Major J. S. K. BOYD of Simla mentioned some new types of dysentery bacilli. In the military laboratories of India during the last three years 7,339 strains of dysentery bacilli had been isolated and over 99 per cent. identified. Of these, 1,121 were organisms having morphological and cultural characteristics of dysentery bacilli, but differing in their antigenic pattern from the four accepted types. Nine new types or races of dysentery bacilli allied to the Flexner group have been isolated. With a view to classification, which should be based on the characters of freshly isolated strains, he suggested a world census of dysentery bacillus types. Dr. MARGUERITE AITOFF of Paris also mentioned a new type of dysentery bacillus isolated at the Hôpital Lariboisière, in morphological and chemical characters resembling the Flexner bacillus, but distinguished by its great virulence for laboratory animals and by the characters of its toxin, resembling those of Shiga's bacillus.

Dr. K. F. MEYER of San Francisco presented some recent studies in botulism, a condition which, in both single and group infections, had increased in the United States and in Canada. In 261 outbreaks (794 cases, 517 deaths) the cause was chiefly inadequately preserved home-canned vegetables. Fish was the chief botulinogenic food in Russia, where there was a high incidence of botulism. Fruit and vegetables preserved by freezing caused no botulism if carefully handled before freezing and consumed directly after thawing. Dr. J. M. ALSTON reported nine human cases which he had observed in London since October, 1933, of septicaemia due to organisms resembling Bang's necrosis bacillus. The general nature of the infection was abscess formation, either single or multiple, and the pus had a very heavy, cheese-like odour. Microscopically the organism appeared in the pus as a small Gram-negative bacillus like Pfeiffer's bacillus. In two of the cases the primary focus appeared to be the female pelvic organs, in one the throat, in five empyema was the chief lesion with no evident site of entry, and in one case either mediastinitis or pericarditis was the earliest lesion found. All, except three of the empyema cases, died.

Serum Treatment of Pneumonia

In opening a discussion on this subject Dr. J. G. M. BULLOWA of New York said that 95 per cent. of the endemic pneumonias in adults were due to various types of pneumococci. The types occurred in varying proportion from year to year and from month to month. The pneumococcus pneumonias were subject to serotherapy. The general application of this specific therapy depended upon the reliability of sputum typing, which had been shown, by checking the results with lung aspiration and blood culture, to be 93 per cent. correct. The fatalities in lobar pneumonia were usually associated with bacteriaemia, which did not always occur with the onset. In certain types serum might prevent and cure bacteriaemia. Its efficient use required large doses early in the disease, though even when given late it might be of value. By the use of serum lives might be saved, the disease shortened, and the frequency of complications reduced. Dr. Bullowa gave a cinematographic demonstration of the management of the pneumonias at Harlem Hospital. The film showed in detail the method of typing serum, lung suction, administration of serum, and the control of dosage by agglutination reactions. It gave statistics in Types I, II, and VII, as well as the method of treating anoxaemia by nasal catheter, tent, and chamber, and the treatment of pulmonary oedema. He was followed by two other American workers on the same subject. Dr. R. L. CECIL of New York gave an analysis of a series of cases of lobar pneumonia in which serum was administered very early in the disease. When patients with pneumococcal pneumonia were treated with homologous serum during the first twenty-four to forty-eight hours the following phenomena were often observed: the disease might be completely aborted, temperature, pulse, and respiration rate dropping to normal within twelve to twenty-four hours after administration; striking improvement in general condition due to disappearance of toxaemia; prevention of spread of infection from one lobe to another, and limitation of area in lobe primarily infected; prevention or rapid check of bacteriaemia; rapid return of leucocytes to normal. These conclusions were derived chiefly from studies on Types I and II, though evidence was accumulating that they applied with equal validity to several other types as well.

Dr. L. D. FELTON of Baltimore related some experiments in which 3,000 young men had been immunized by a single injection of 2 mg. each of Types I and II soluble antigen, while a group of 9,000 men under the same conditions constituted a control. Among these 9,000, within a period of five winter months, there were eight cases of pneumonia with two deaths, while no cases occurred in the inoculated group of 3,000. In a second experiment 14,000 young men were inoculated and 14,000 used as

controls. Only 1 mg. of each type was used. The period of observation was for seven months. Among the inoculated men there were thirteen cases of pneumonia with no deaths, and in the control group twenty-three cases with two deaths.

Dr. R. CRUICKSHANK discussed the serological differentiation of pneumococcus types, and two Manchester workers, Dr. G. J. LANGLEY and Dr. LOIS STENT, the agglutinin control of serum treatment and the control of dosage. Dr. L. E. H. WHITBY said that serum therapy was not justified in pneumonia unless the type had been established. Reliable methods for typing from sputum were the direct method, with modifications involving staining, mouse inoculation, and agglutination of a culture. For estimating the sufficiency of serum dosage the clinical features were the most reliable index. Assessment of resistance by agglutinin content of the blood was unreliable. Type I infections occurred in the relatively young, and the prognosis, even without serum, was better than in all other type infections. Serum need only be given to those Type I subjects in whom the prognosis was anxious. Type II infections were very toxic, and all should receive serum. From a series of 184 cases it was concluded that Types I and II serum was of proved value and should be given to all cases, even late in the disease, where it was felt necessary to exploit every remedy to achieve cure.

Professor F. G. BLAKE of Yale emphasized the importance of early treatment in the serum therapy of pneumonia. The crucial period in lobar pneumonia was the first forty-eight to seventy-two hours. It seemed probable that immune serum could only enter and affect the local infection during the period of congestion and serous exudation. As humoral defence was the only one afforded by antiserum, it seemed reasonable to conclude that it must be provided before the other great vital function—namely, cellular defence—had become so impaired that it could no longer co-operate in bringing about recovery.

Parasitology

The Section which received the smallest number of contributions was the one on parasitology. To a discussion on the biology of the malarial parasite Lieut.-Colonel S. P. JAMES and Sir RICKARD CHRISTOPHERS brought interesting contributions, the latter relating some observations on *P. knowlesi* infection in malaria therapy. This plasmodium, obtained through the Malarial Survey of India, has been kept in passage by inoculation in *Silenus rhesus* in London for three years without loss of virulence or other characters. Professor H. N. SWELLENGREBEL of Amsterdam discussed factors influencing the transmission of malaria plasmodia by anopheles in nature. Dr. R. E. DYER of Washington reported a notable increase in the area of known distribution of both typhus and Rocky Mountain spotted fever in the United States during the past few years. Dr. E. SERGENT of Algiers and Dr. HAMILTON FAIRLEY opened a discussion on immunity against animal parasites, Dr. Fairley dealing particularly with serological reactions in somatic helminthiasis. Four workers from San Francisco described an investigation into mussel poisoning in which the specific organism (dinoflagellata) had been identified.

Serology and Immuno-chemistry

A discussion, to which a dozen speakers from as many countries contributed, took place on blood grouping. Dr. S. C. DYKE of Wolverhampton suggested some practical considerations governing the determination of compatibility for blood transfusion. For purposes of transfusion knowledge of the groups of the donor and recipient was not essential; all that was necessary was the knowledge that the serum of the recipient would not agglutinate the red cells of the donor. In the absence of this knowledge, and if reliance were placed on compatibility of groups alone, trouble might arise from the presence of unsuspected agglutinins in the serum of the recipient. The infusion of blood satisfying the criterion that the red cells were not susceptible, except at low temperature, to agglutination by the recipient's serum could never give rise to transfusion shock.

The significance of allergy in disease was the subject of another important discussion opened by Professor E. L. OPIE of New York, who was inclined to uphold the widespread tendency to refer the unexplained characters of certain diseases, such as lobar pneumonia, rheumatic fever, and glomerular nephritis, to allergy. Some trustworthy observations, he said, had been assembled in support of this view. Further knowledge of the pathogenesis of infectious diseases was dependent upon a better understanding of the influence of developing sensitization and resistance upon their functional and anatomical characters.

Finally two whole mornings, with over forty speakers, were occupied with a discussion on the relative value of antitoxic and antibacterial immunity in the prophylaxis and treatment of human and animal diseases in which the invasion by the causative bacterium might occur in a focal or generalized form. The openers were Dr. A. B. WADSWORTH of New York, who dealt with antitoxic and antibacterial sera in the treatment of infection, and Dr. F. GERLACH of Vienna, who spoke of reasons for failure of preventive or curative inoculation against infectious diseases. One noteworthy paper was by Professor A. FLEMING and Dr. I. H. MACLEAN, who described the treatment of a number of patients suffering from various localized staphylococcal infections with toxoid or with toxoid and vaccine. The antitoxic response was found to vary greatly in different patients; in some, the administration of a few units of toxoid was followed by a rise of antitoxin to 5 units or more per c.cm., while in others this figure could not be reached even when much larger amounts were given. In some cases recurrences arose in patients with a higher antitoxic content.

Professor J. W. MCLEOD of Leeds discussed the part played by antitoxin in immunity to different types of diphtheria bacillus. During the last four years observation on the existence of three well-defined cultural types of the diphtheria bacillus had led to the surprising conclusion that there was a group of strains—the "gravis" type—which had been responsible for the most severe epidemic manifestations of diphtheria during that period but were very poor toxin formers *in vitro*. It appeared that the "gravis" strain was distinctly more capable of surmounting the barrier of toxic immunity than the other types. It had still to be determined whether this difference was due to special qualities of the bacterial toxin or to other bacterial characters. Dr. A. FELIX discussed the serum treatment of typhoid fever. No specific serum treatment of typhoid which was of recognized value had yet been observed, in spite of many attempts made during the past thirty-five years. He said that the commercial antityphoid sera so far tested had been found devoid of Vi antibody and very poor in O antibody, yet upon the presence of both these antibodies the efficacy of a therapeutic antityphoid serum depended. Dr. Felix suggested that antigenic analysis of other pathogenic bacteria might disclose the presence in them of yet unknown but essential antigenic constituents and might lead to the solution of some of the practical problems of active and passive immunization.

We have touched on only a few of the communications made to the congress and have left on one side the discussions in the field of economic bacteriology—discussions which ranged from the influence of temperature on the estimation of bacteria in ice-cream to the microbiology of the upper air, and from studies on the pasteurization of wine to the effect of certain groups of bacteria in bringing about decay in the stones of buildings—as well as in microbiological chemistry and the general biology of micro-organisms. An analysis of the countries from which the contributors of papers came gave the following results:

Great Britain and Northern Ireland	141	Russia	11
United States	80	Switzerland	10
Germany	36	Canada	10
France	30	Holland	9
Denmark	13	Italy (all from Milan)	8

More than twenty other countries were the source of one or more communications. During the congress a

large number of demonstrations were given by members, and an exhibition of scientific instruments and apparatus was also arranged. Visits to the universities of Oxford and Cambridge brought a strenuous week to an end.

THE CONGRESS BANQUET

The official banquet for members of the congress and the ladies accompanying them was held at the Trocadero Restaurant on the evening of July 31st, when Professor LEDINGHAM presided over a company of five hundred. The first toasts were "The King," "The Sovereigns and Heads of States here represented," and "Our Patron H.R.H. the Duke of Kent, K.G."

Proposing the toast of "The Congress, and of Antonj van Leeuwenhoek," Professor HANS ZINSSER of Boston recalled in humorous terms the progress of microbiology since 1674, when the linen-draper of Delft discovered his "little animals." He thanked the members of the British committee for their successful efforts, and said that this had been truly an international congress for the promotion of knowledge. The PRESIDENT, in reply, expressed his acknowledgement of the many kind remarks he had heard during the week, adding that the honorary secretary, Dr. R. St. John-Brooks, deserved all the tributes paid him. Professor KLUYVER said that it was a privilege to represent Delft at such a gathering. Leeuwenhoek belonged to all the nations in the golden age of Holland, and his correspondence with the Royal Society of London gave him great encouragement. The Academy of Sciences in Amsterdam was preparing an edition of Leeuwenhoek's works in Dutch with an English translation. This year's congress had enjoyed the hospitality of University College (the home of Lister) under the inspiring leadership of Ledingham, and with Leeuwenhoek symbolically commemorated on the badge of membership—three great L's. Professor MESNIL of Paris made a graceful speech in French expressing appreciation on behalf of the fellow-countrymen of Pasteur. Professor NEUFELD of Berlin spoke first in German, then in English, with many amusing sallies, historical and topical, and ended with the hope that all future congresses might be as successful and as harmonious. Dr. EDWARD MELLANBY, who also replied to the toast, recalled the simple, happy days of bacteriology when he was a student; since then Cinderella had been converted into a White-headed Boy, and all must do everything in their power to help along the wonderful new science of microbiology.

The health of the guests was proposed by Dr. MURIEL ROBERTSON, who likened this gathering in London to the members of a rather large and troublesome family of good instincts and training; she associated the toast with "the women of the congress." Sir FREDERICK GOWLAND HOPKINS, in reply, expressed gratification at the outstanding success of this meeting. He had watched the progress of microbiology through half a century, and had had the privilege of meeting Pasteur and Metchnikoff, and Bordet at the beginning of his great career. The toast was also responded to by Professor FORSSMAN of Lund, Professor BUCHANAN of Iowa, Professor BORDET of Brussels, and Lord HORDER.

EMPIRE DENTAL MEETING

LONDON, JULY, 1936

The British Dental Association, with its affiliated bodies in the Dominions and Colonies, arranged the first Empire Dental Meeting, which was held in London during the last week of July. It was opened by the MINISTER OF HEALTH (Sir Kingsley Wood), who mentioned the arrangements made by his department and the local authorities for the school dental service (which now employed the equivalent of over 600 whole-time dental officers) and for the dental treatment of nursing and expectant mothers. He also said that the approved societies which offered dental benefit to insured persons had a membership covering three-fourths of the insured population.

Mr. FRANK J. PEARCE devoted his presidential address largely to pleading the need for post-graduate study facilities and research facilities in dentistry. There were a number of post-graduate courses at dental schools, but the need was for a central post-graduate school. Such an institution might solve another problem, namely, the co-ordination of dental research throughout the Empire. Dental research had not made the same appeal to the lay mind as medical research; it was not so spectacular nor so apparent as a means of saving life, and yet dental disease was in fact the most prevalent of all ills to which mankind was subject. He appealed to some public-spirited philanthropist to do for dental surgery what had been repeatedly done for medicine.

Sir GEORGE NEWMAN addressed the congress on the dental problem and preventive medicine. He disputed the common assertion that malnutrition was prevalent and increasing. How could there be widespread malnutrition with a steadily falling sickness rate and death rate for nutritional diseases and a rapidly rising standard of health? Nevertheless, an appreciable part of the population was unwisely or inadequately fed, and this had its important bearing on the incidence of dental caries. He suggested five lines of action for an effective national solution of the dental problem: proper nutrition of motherhood and infancy; education in a suitable dietary; the acquirement of the daily habit of meticulous cleanliness of the teeth; public facilities for early and conservative dental supervision; and, finally, dental education of the people. There had been a great advance in public dental provision, but its scope was far from complete, and in certain respects there still remained serious deficiencies. The gravest of these was that when the child left school he passed outside any dental supervision whatsoever, with the wasteful result that the condition of his teeth, so greatly improved by the school dental service, rapidly and seriously deteriorated, so that when at the age of eighteen he was inspected by the Army or industrial authorities they were apt to declare that he could have had no school dental provision at all. The time had come for the extension of dental benefit under the Insurance Act on terms which would make the facilities available and acceptable to all insured persons from 16 years of age.

Discussion

In the discussion which followed Sir George Newman's address, Sir FRANCIS ACLAND, chairman of the Dental Board, also referred to the unfortunate cessation of dental inspection on leaving school, when the young person tended to join that large army of the older generation who let their teeth get worse and worse until they had to have them all out, meanwhile suffering no small damage to their general health. Sir NORMAN BENNETT said that a statutory dental service under the National Health Insurance Acts would do a great deal of good, but it would not be enough. What was wanted was a system of regular inspection and treatment, such service to be based on a capitation system. If some borough like Cambridge, where treatment so far had been more successful than in other places, and where there was a nearly complete system, would initiate an experimental voluntary system on a capitation basis for children leaving school, it would be a pioneer enterprise of great value. Mr. LEWIN PAYNE, referring to the close relationship between oral and systemic disease, said that the study of medicine as part of the curriculum of the dentist was becoming increasingly important. It would be a great advantage to the community and the profession, though it would entail much expenditure of time and money, if every dental practitioner became a medical graduate before taking up his specialty—already a requirement in some countries.

One of several technical discussions was opened by Sir WILLIAM WILLCOX, following a paper by Dr. E. W. FISH and Dr. I. H. MACLEAN on the local distribution of mouth streptococci in the tissues. Sir William Willcox said that when in 1922 he published a paper under the auspices of the Dental Board concerning the systemic effects of dental sepsis he was chaffed by his colleagues at the long list of diseases which he suggested might be associated with that

condition. But he maintained that his statements had been in no way exaggerated ; in fact he had said too little. Many common illnesses were due to streptococcal infections, often having their nidus in the tissues around the teeth. He endorsed the statements in the paper by Drs. Fish and Maclean that ordinary pyorrhoea should be dealt with, not by wholesale extraction, but by treatment of the gum surfaces. Dr. Arthur Bulleid, in further discussion, said that the factor of greatest importance was one which could not be assessed—namely, the resistance of the patient to infection ; he regarded dental infection as a streptococcal overload.

Other discussions were on orthodontic education, dentistry for juvenile patients, the public dental service, and research problems. An exhibit was staged by the Dental Associations of the Dominions illustrating dental practice and dental education in each of them.

Scotland

Edinburgh Medical Graduation

At the summer graduation of Edinburgh University on July 22nd Principal Sir Thomas Holland conferred the degrees of M.B. and Ch.B. upon 125 graduands, and that of M.D. upon sixteen graduates. The honorary degree of Doctor of Laws was conferred upon Dr. Mervyn Henry Gordon, C.M.G., C.B.E., F.R.S., consulting bacteriologist to St. Bartholomew's Hospital, London, and in presenting him for the degree the dean of the faculty of medicine said that he had long been recognized as one of the leaders of twentieth century bacteriology ; his work on small-pox had been an outstanding contribution to the knowledge of virus disease ; during the great war he had led the campaign against the microbe of cerebro-spinal meningitis, and he had been an original member of the Advisory Committee on the health of the British Army since 1909. Professor W. T. Ritchie acted as promoter, recommending the graduands for their degrees, and in his speech he said that the ritual of this ceremony had been handed down by tradition from mediaeval times. Education, he continued, aimed at development of character and intellect, not at erudition, and fulfilled the desire for self-realization and social progress. The growth of medical learning, influenced by the expansion of scientific knowledge, was producing progressive evolution of the teaching of medicine. In collaboration with the municipal corporation, which had always promoted and fostered education in Edinburgh, the University now had a golden opportunity of developing and strengthening its teaching of medicine. With special reference to those who had just graduated, he said that they were the guardians of a heritage which had been handed down since the days of Hippocrates. Some of them, he hoped, would continue their training elsewhere, for much could be gained by even a short visit to another medical school. Many unrivalled opportunities for clinical study and research were available in Canada and the United States of America, where Edinburgh graduates were always assured of a cordial welcome. Those of them who were to become general practitioners would be apostles of health, combating ignorance, advocating personal and communal hygiene. As man's mode of life became more artificial, the divorce from nature brought in its train many ills against which the advice of the family doctor was the best preventive. Since the expectation of life was increasing, their services also were likely to be in greater demand for the relief of the manifold disorders which prevailed in the later and degenerating period of life. The vast expansion of knowledge in the realms of pure and applied science within recent years had revolutionized medicine. They were slowly beginning to gain a closer insight into living matters and to acquire more control over the functional activities of body and mind. Those who engaged in research must avoid the fatal error of waiting for inspiration, and remember that of all productive work nine-tenths was drudgery. Every scientific discovery was the outcome of long brooding over most patient observations. The field of inquiry which the clinician alone could explore was boundless, yet with some exceptions the endowment of clinical research was lamentably neglected by both public and private benefactors who made munificent bequests for the furtherance of research in pure science.

Prolonged Narcosis for Mental Disorder

The 109th annual report of Dr. W. D. Chambers, physician-superintendent of James Murray's Royal Asylum, Perth, shows that 332 patients had been treated during the year from April, 1935, to April, 1936. There had been 130 admissions (sixty males and seventy females), of which 105 were voluntary. Of the discharged patients 106 had recovered or been relieved, ten were unimproved, and eighteen had died. The total revenue was £32,332, and the expenditure £27,339. Reference was made to the method of treatment of patients suffering from mental illness by prolonged narcosis, in which the patient was given regular doses of a sedative remedy sufficient to maintain a state of sleep with intervals of partial consciousness for two or three weeks. The treatment was described as dangerous since not all patients were sufficiently robust to undergo it, and even with the strongest most careful observation and nursing were required. The immediate result of such treatment was a drastic depression of all nervous and mental activity, and the improvement to be gained later might be regarded as due either to cessation of chemical reactions in the nerve cells or to the inhibition of fixed ideas, complexes, and modes of thought. On the whole, the results obtained from this form of treatment had been disappointing. Most of the patients had showed improvement, and in some there was a remarkable change in the mental symptoms, but in many the patient subsequently relapsed. There had been no fatalities, but in a few cases it had been advisable to stop the course after a few days. Good results were continuing to be obtained from occupational therapy.

England and Wales

Notification of Manganese Poisoning

Section 73 of the Factory and Workshop Act, 1901, requires every medical practitioner attending on, or called in to visit, a patient whom he believes to be suffering from poisoning by lead, phosphorus, arsenic, or mercury, or from anthrax, contracted in a factory or workshop, to notify the case to the Chief Inspector of Factories at the Home Office ; and a similar obligation is imposed on the occupier of a factory or workshop to send written notice of every such case to the certifying surgeon and inspector of factories for the district. The Secretary of State has now made an Order, in pursuance of subsection (4) of that section, extending its provisions to all cases of manganese poisoning. The object of notification is to afford to factory inspectors a clue to dangerous conditions over which they can exercise control. The crushing, grinding, and sieving of ores containing manganese dioxide expose workers to dust, and it is from these processes that the majority of cases of manganese poisoning have arisen. Manganese dioxide is used extensively in the manufacture of dry batteries, also in the manufacture of glass. It has been stated that in the smelting of iron ore containing considerable quantities of manganese cases among furnace workers may occur. The characteristic signs and symptoms of manganese poisoning are a stolid mask-like face, low monotonous voice, cramp in the legs with muscular twitching, increased tendon reflex, ankle and patellar clonus ; retropulsion and propulsion, a peculiar gait described as slapping, the patient walking on a broad base ; emotional disturbance, occasionally uncontrolled laughing or crying. Degenerative changes have been described as occurring in the central nervous system, but these changes do not shorten life. Serious poisoning produces crippling effects.

Health of Liverpool

The report on the health of the city of Liverpool during 1935 reflects much credit on Dr. W. M. Frazer, the medical officer of health, and his staff. It occupies

nearly three hundred pages, including a large number of charts and statistical tables, and every item is readily accessible. The birth rate of 20 compares with 20.3 in the previous year, and, with the exception of 1933, is the lowest ever recorded in the city. On the other hand, it is satisfactory to record a death rate of 13.2, only a slight increase over the best previous figure of 13.1 in 1934. The number of deaths from cancer continues to increase, chiefly among elderly males, the latest rate being 1.51 per 1,000 of the population. Less than a century ago Liverpool was one of the three unhealthiest towns in the kingdom, and even during the period 1871–80 the general rate of mortality was more than double the present figure. The present general infantile mortality is only 43.9 per cent. of the figure recorded from 1896 to 1900. Cases of infectious disease show a diminution of 5,526 on the number for the previous year. The section devoted to maternity and child welfare includes a very full report and analysis of maternal deaths. Of fifty-nine deaths directly due to child-bearing, twenty-six were the result of puerperal sepsis, and in half of these cases sepsis followed normal labour. In the sanitary section of the report, the measures employed for rat destruction are of interest, for in a port like Liverpool constant vigilance is necessary to guard against the possible introduction of plague. Ten rat-catchers are regularly employed, and each day a number of rats are brought to the city bacteriologist for examination; 15,192 brown rats and 970 black rats were caught in the city and 661 brown and 5,394 black were caught in the port. More than 7,000 rats were examined, the greater proportion of these being black rats from the port. In two of the latter plague bacilli were discovered, a testimony to the vital importance of microscopical examination. No case of human plague occurred during the year.

St. Mary's Hospitals, Manchester

The report for 1934 of the Maternity Department of St. Mary's Hospitals, Manchester, which is now published, contains a comprehensive analysis, prepared by Dr. E. A. Gerrard, of 3,488 patients treated by the hospital staff during the year—2,438 in the wards and 1,050 in their own homes. Of the in-patients 1,525 were "booked" and 913 were emergency cases. There were thirty-four maternal deaths, representing a mortality of 1.39 per cent. of the total in-patients; the mortality in emergency cases was 2.53 per cent. of their total. The puerperal morbidity rate, estimated by the British Medical Association's standard, was 9.3 per cent. (183 patients), or 8.04 per cent. in "booked" and 11.8 per cent. in emergency cases. Two hundred and seventy-four cases of contracted pelvis were treated: 103 by induction, 120 by Caesarean section—maternal mortality in the "booked" cases (218) being 1.4 per cent., and foetal mortality 5.2 per cent., as compared with 3.6 per cent. and 14.4 per cent. respectively in the emergencies. There were sixteen tubal pregnancies, in nine of which rupture had occurred; all were treated by abdominal section, and one patient died. Of five patients in whom the uterus had ruptured two died, and of thirty-one with eclampsia, twenty-seven of whom were admitted as emergencies, four died, a mortality of 12.9 per cent.

E. Silvestroni (*Lo Sperimentale*, April, 1936, p. 201) studied the effect of bilateral suprarenalectomy on the growth and reaction to insulin of white rats in relation to their age and temperature, and obtained the following results: Adult rats stood the operation better than old ones, and the latter better than very young ones. Low temperatures are an unfavourable sign. If the animals die, death generally takes place within 48 hours after operation, less frequently during the next few days. The rats are still capable of reproduction after the operation, but the breeding power of the males is diminished, and the females do not always carry till full term. Growth is not impaired but only retarded for some time. Increased sensitiveness to insulin persists for six months after the operation.

CORRESPONDENCE

Ophthalmia Neonatorum and Arthritis

SIR,—In commenting (July 18th, p. 121) on the record of a clinical example of the above association Dr. Jean M. MacLennan adds that a hasty search has not unearthed "any similar cases in the English literature." In view of this statement it would seem just to revive the memory of an important and apparently original contribution by Mr. R. Clement Lucas, the well-known surgeon to Guy's Hospital. Mr. Lucas's first publication was in the form of a note on an individual case (*British Medical Journal*, July 11th, 1885); he recorded two other experiences at later dates in the same year; and in 1899 he presented a full study of the subject to the Royal Medical and Chirurgical Society (*Transactions*, vol. lxxxii) with a summarized record of twenty-three cases collected from various (mostly Continental) sources. He adds: "The publishers of these reports almost invariably gave me the credit of having made the first observation of this disease."

As confirming Dr. MacLennan's comment on the rarity of the records, Mr. Lucas noted that in the interval 1885–99 only one example of the condition was recorded in Great Britain (R. G. Fendick, *British Medical Journal*, 1885, ii, 830). My own immediate interest in the subject is related to a case I described to the Society for the Study of Disease in Children in 1902.—I am, etc.,

London, W.1, July 31st. C. O. HAWTHORNE.

Treatment of Burns

SIR,—Since reading a letter from Dr. L. J. Panting in the *Journal* of February 29th (p. 446) I have been using the solution he suggested in the treatment of burns. The solution is one of tannic acid, 20 per cent., in acriflavine, 1 in 1,000 (Professor John Fraser's solution). As Dr. Panting states, the solution is cheap and keeps indefinitely. Dr. Panting suggested using a camel-hair brush to apply it, but lately I have been using a spray in the same way as the weaker solution is used. Professor Fraser's solution sprays very well, and when left to the patient is much cleaner than the brushing method.—I am, etc.,

JOHN A. ROSS, M.A.Camb., M.R.C.S.

Walton, Liverpool, July 30th.

Anatomy in the Curriculum

SIR,—Dr. Chalmers Watson's reply, in your issue of July 25th (p. 196), to my letter of July 4th (p. 43) is fair in so far as the views I expressed were fully intended to support a reform in the teaching of anatomy. I would go further and quote from the report of the British Medical Association Committee on Medical Education (*Supplement*, April 21st, 1934):

"For the medical student, human anatomy should be regarded and treated as a study of the living rather than of the dead body. Even so, it should be intimately concerned not merely with structure, but with the relation of structure to function, and with occasional reference to cases of impairment of function as manifested clinically."

No words could more aptly express my own attitude. When, however, the report proceeds to recommend that dissection of the entire cadaver is not essential, my agreement ends. I have previously stated my belief that a thorough anatomical knowledge is the basis of accurate diagnosis, both to the physician and to the surgeon alike.

My experience is that personal dissection, supplemented but not replaced by demonstrations, is the soundest and surest method of acquiring this essential knowledge. Such a belief is founded on fact, as can be testified by any teacher of anatomy in this country.

A period of eighteen months to two years does not seem excessive for the study of the basic sciences of medicine—namely, anatomy and physiology—with the ancillary subjects of histology, embryology, applied anatomy and physiology, and elementary pathology. Although I am still of the opinion that "some of the time at present spent in the dissecting room could be more profitably utilized," it is on the understanding that such time would be devoted *in the dissecting room* to the acquirement of that knowledge which will form the foundation for clinical work. Many of the basic facts of medicine and surgery can be deduced logically from anatomy and physiology, and it would surely be a gross error to cause the teaching of these clinical subjects to revert to the unscientific listing of signs and symptoms. This would be the inevitable result if the period of pre-clinical studies were curtailed. It is precisely this stress on the memorization of detail which the teachers of anatomy are endeavouring to obviate and which the report of the B.M.A. committee so emphatically condemns.

It is my firm conviction that this change in anatomical teaching can be brought about, not by the omission of the dissection of a whole part of the body, but by an improvement in the present methods of examination and by a closer relationship between the pre-clinical and clinical subjects. Such a view is entirely consistent with my concluding remarks that:

"The present teachers of anatomy in this country are for the most part in agreement in regard to the former, and great improvements have been made in this direction throughout the country. The new proposals of the General Medical Council have taken a big step in the second direction—namely, the bringing together of pre-clinical and clinical years."

It seems to me that this statement in no way contradicts my earlier remarks on the subject, as suggested by Dr. Chalmers Watson, since it merely indicates that a certain amount of progress has been made but that the ideal has not yet been attained. Dr. Chalmers Watson's support of a more specific training in preventive medicine is highly commendable, but, apart from its relationship to the curriculum as a whole, it does not lie within the field of the particular problem which I discussed in my previous letter.—I am, etc.,

Department of Anatomy, Manchester University, July 30th. DONAL SHEEHAN.

Overworked Doctors

SIR,—I trust that Sir Farquhar Buzzard will forgive me if I comment on a loose statement in his Presidential Address at Oxford (*Journal*, July 25th, p. 163). He said:

"Under the present system it would be necessary to double the number of doctors in order to obtain an adequate service, and such a measure would rapidly lead to their starvation."

This deduction is untrue, because the fifty thousand potential doctors required to double our present numbers have been born already, and are at school now; they will have to be fed in any case, whether they become doctors or not.

Evidently the statement was not meant to be taken literally, so let us apply it metaphorically: "the community cannot afford to support an extra fifty thousand doctors." Why not? What do doctors require which cannot be supplied? Motor cars? Good holidays? Expensive boarding schools for their children? The newspapers are half filled with advertisements of these things, and the countryside is made hideous with them. How, then, can we say that the community cannot support as many doctors as it needs?

By making statements like this we are simply acquiescing in the continuance of poverty amidst plenty. No disease was ever cured by vague and inaccurate thinking, nor will our social troubles be. The overwork from which the professional classes suffer—and there is no doubt that the medical profession is overworked—is only a symptom of the trouble as it affects them. What was a delightful occupation to the Greek physicians is harassing toil to us; and it is so for no good reason at all. We put up with it just as people in the Middle Ages put up with the plague—they thought it could not be prevented, and that was all about it. We do exactly the same, but our problem is not nearly so difficult as theirs; we have only to learn how not to destroy what we have taken the trouble to make (for example, cotton spindles), to grow (fruit), or to catch (herrings), and how to encourage production instead of restricting it. But just so long as we make misleading statements like the above, and acquiesce in actual and potential sabotage, as we all do, we shall continue to be the slaves we are and to lead the dog's life which we do; and the public will continue to have what Sir Farquhar Buzzard considers an inadequate medical service.

Do not let any young man entering the profession think that by toiling from morning till night every day of the week he is rendering true and laudable service to God, his country, or humanity: he is merely doing penance for his and our folly, ignorance, and cowardice. For it is cowardice in a learned profession to keep silence when it knows it is giving inadequate service owing to overwork, and that a large amount of its work is due to malnutrition and slum conditions, all of which are preventable.—I am, etc.,

Norwich, July 28th. FREWEN MOOR.

"Under the Influence"

SIR,—Without wishing to enter the much-discussed question of the fairness or otherwise of the police in the matter of their treatment of persons suspected by them of offences while in charge of motor cars, there is one paragraph in Dr. Frank Moore's letter (*Journal*, August 1st, p. 260) which I think cannot be allowed to pass without adverse comment. It is his last one, wherein he cites the large number of killed and injured, presumably as a result of motor accidents, and on this figure at once sees the necessity for eschewing all alcohol on the part of anyone who is going to drive a car. What about the meandering pedestrian also eschewing alcohol so that he may be even reasonably alert? No one desires to condone the motorist who staggers to his wheel and drives to the danger of us all, whether afoot or in a car, but this constant placing of the blame of all accidents on the motorist is getting us a very short way towards the reduction of road fatalities. I hold no brief for alcohol, but request fairness for all—and that at present is not accorded the motorist.—I am, etc.,

Glasgow, Aug. 3rd. ARTHUR INNES.

SIR,—Dr. Frank Moore takes me to task for my letter in the *Journal* of July 25th (p. 199). He says that it is improbable for a person to be suffering "from all of six different diseases which would give positive reactions to all the six tests at one and the same time." I did

not mention "diseases." I simply said that thousands of normal people may have a smell of alcohol in the breath, a quick pulse, a furred tongue, and bad handwriting, and that if this is brought forward—when all other tests are negative—as evidence of drunkenness, then no motorist is safe. Dr. Moore describes this line of argument as "absurd." I shall be perfectly happy to leave it to the judgement of others in which direction the absurdity lies.

"It was not necessary to employ such costly means of defence." Has Dr. Moore never heard of cases in which innocent men are well-nigh ruined by legal costs before their innocence is proved? He indicates that the thousand casualties on the roads last week (there were five thousand as a matter of fact) are an argument for total abstinence by all. Why, if the proportion of accidents caused by drunken drivers is 4 per 1,000? Why not abolish gas ovens because a tiny minority use them for lethal purposes? He finally says: "It is better to eschew alcohol entirely if one has reason to suppose that one will be called upon to drive a car in the immediate future." Well now, as nearly all the 55,000 doctors on the *Register* do not know from one five minutes to another whether or not they "will be called upon to drive a car in the immediate future," they should all, according to Dr. Moore, become total abstainers at once. —I am, etc.,

July 30th. X. Y. Z.

"Under the Influence"—of Carbon Monoxide

Sir,—A case of monoxide gas escaping from the exhaust of a saloon car affecting the driver and being confused with alcoholic poisoning may be of interest to police surgeons and others.

A young man had noticed a defect in the exhaust of his car, as it was making a noise when he drove to a friend's house. He and his host had supper, with only one bottle of beer between them. He left the house shortly before midnight, and had a chat after starting his engine. When he had driven about three miles he felt sleepy, and was stopped by a police car. He was taken to the police station and charged with being drunk. In court the police said that the car was zigzagging and the driver was hopelessly drunk. The police surgeon certified him as being "under the influence of alcohol," but said he did not go through his tests very badly. At 2.10 a.m. he was seen by another police surgeon, who gave evidence that he was then quite sober. The car was taken to a garage the next morning, and a mechanic gave evidence that there was a leak in the exhaust and fumes were getting under the floor boards directly under the driver's seat. The police admitted a noisy exhaust, and a medical specialist gave evidence that the effects of carbon monoxide gas and alcohol would be very similar at first, but the effects of carbon monoxide would wear off quickly while the effects of alcohol would be more lasting.

In this case the evidence was "hoplessly drunk" at midnight; then half an hour later "Tests not done so very badly"; and at 2.10 a.m., according to another police surgeon, "Quite sober." This was definite evidence that the effects had passed off quickly. The magistrates were some time considering their verdict, which was "Proven." The defendant was fined £5, including costs, but his licence was not suspended. The lenient sentence showed that the justices were in doubt.

My reason for writing this letter is to impress upon police surgeons the importance of an escape of fumes from an exhaust, especially in a closed car. Driving with a defective exhaust should be punished more severely—not for the noise it makes but for the danger it is to the driver.—I am, etc.,

F. A. L. Burges, M.B.E., M.R.C.S.

Birmingham, July 27th.

Tired Motor Drivers

Sir,—During the Annual Meeting at Oxford recently the subject of motoring fatigue came into prominence. At this holiday season, when so many motorists are attempting longer runs than those to which they are normally accustomed, there is a special danger of their faculties being dulled by fatigue.

Let us earnestly warn the motorist against this danger, and urge him whenever he is feeling the least bit tired to pull up and rest for a few minutes. Admittedly some restorative is desirable, but there is no reason why it should be of an alcoholic character, for there are other beverages which are perfectly harmless and yet which possess restorative qualities. That the danger is a very real one is recognized by the Highway Code (paragraph 4), which says: ". . . be sure that your alertness or sense of caution is not affected by alcohol or fatigue."—I am, etc.,

London, W.C.1, July 28th. Courtenay C. Weeks.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a congregation held on July 31st the following medical degrees were conferred:

M.D.—B. C. Nicholson, L. P. J. Evans.

M.B., B.Chir.—F. R. R. Martin, H. S. Davis, C. N. Gosse, D. J. Watterson, N. P. Brown.

M.B.—R. M. Jones, J. B. Tracey, H. S. Buckland, C. U. Gregson, J. F. Paterson, W. T. Cooke, T. M. Daniel.

B.Chir.—*B. S. C. Gaster, *F. C. Maddox, *A. L. Jackson, *A. D. Hodges, J. A. Falk, C. M. Heath, D. R. Seaton, R. C. Droop, J. C. Newbold, J. W. Parks, J. Diver, J. W. Landells, T. J. Morton, J. F. L. Walley, A. M. Weston, A. C. Fraser, C. J. F. Coombs, H. P. R. Smith, R. G. Bickford, J. E. A. David, R. Solley, M. H. Harding, R. H. A. Swain, J. R. C. Williams, J. Mackellar.

* By proxy.

UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

M.D.—*Branch I (Medicine)*: Beryl D. Corner, R. D. Green, Dorothy J. Healey, M. H. K. Kane, Betty M. Kemp, R. I. Lewis, S. F. Marwood, H. E. S. Pearson, L. O. Roberts, J. Sakula, W. N. P. Wakeley. *Branch II (Pathology)*: I. Doniach. *Branch III (Psychological Medicine)*: J. R. Murray. *Branch IV (Midwifery and Diseases of Women)*: H. Ainscow, Betty F. Goldsmith, C. C. Harvey, E. W. Martindell. *Branch V (Hygiene)*: Janet M. Done, Elsa V. McLaggan, T. Standring.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

An ordinary meeting of the Council of the Royal College of Surgeons of England was held on July 30th, with the President, Sir Cuthbert Wallace, in the chair.

Mr. T. Stewart Heslop, F.R.C.S., of Manchester University was appointed a Leverhulme Scholar for one year, for a research on the autonomic nerve supply of the stomach in relation to peptic ulceration.

Diplomas

A diploma of Fellowship was granted to E. J. Grieve of Melbourne University and St. Bartholomew's Hospital.

Diplomas of Membership were granted to the following candidates, who have passed the final examination in pathology, medicine, surgery, and midwifery of the Examining Board in England:

R. B. Abdel-Messih, C. A. P. Achyutan Pillai, G. P. Arden, F. J. S. Baker, Beryl E. Barsby, L. Bass, W.-F. E. Baumann, F. G. A. Beckett, S. J. Bellgard, B. B. Bhatia, B. J. Bickford, F. A. Bleaden, K. E. Bond, G. C. Brentnall, J. C. Brundret, J. T. H. Butt, Phyllis M. Button, P. C. Calvert, R. S. Castle, R. Chignell, W. A. Cobb, J. A. Cochrane, J. W. C. Cochrane, D. H. Coe, P. N. Coleman, Florence I. Collier, F. C. Collingwood, K. E. Cooper, Gwendolen K. G. Coote, W. W. Coppinger, Barbara G. Courtney, A. J. F. Crossley, H. O. Crwys-Williams, Enid Cyriax, L. F. Dale, Hilla Damry, D. A. Davies, J. Devlin, P. R. Dias, E. N. Dowell, C. H. Drake, C. M. Dransfield, J. J. Dubash, H. L. Ellis, J. Evans, Margaret A. B. Fleming, W. A. J. Fox, D. B. Fraser, K. D. Fraser, E. Geal, A. C. Gee

A. T. George, A. J. Gill, R. Gómez, A. Gourevitch, I. C. A. D. P. Graham, C. H. Gray, C. W. E. B. Greaves, S. G. Griffin, K. Hamiduddin, J. Hanekom, M. H. Harding, J. W. K. Harper, F. E. S. Hatfield, W. H. Hayes, C. F. Ll. Hill, S. Hills, F. G. Hollands, L. J. Honeywill, J. S. Horn, R. A. Hughes, J. Hynes, W. L. Isaac, S. Jackson, G. C. W. James, S. F. Jayawardene, Ursula J. Jeffery, Gladys I. Jeffree, S. A. Jenkins, T. P. N. Jenkins, E. H. Jones, M. A. Jones, L. N. Kaplan, A. I. Kinnear, J. D. Kinnear, B. W. Lacey, Marjorie F. Landau, D. J. Lapping, J. I. H. Laurie, A. D. Ledward, J. Lefcovitch, V. N. Leyshon, Mary M. M. Llewellyn, V. D. Logue, Dorothy K. Lopez, H. R. Loughran, J. Lurie, R. I. Macbeth, J. Mackellar, F. R. Malan, J. A. Manifold, M. A. Margo, M. Markowe, A. H. Masina, Mary D. Mellersh, J. F. Meynell, W. A. M. Miller, N. H. M. R. Monro, S. P. Morrison, T. J. Morton, T. P. Myles, A. G. Nambiar, E. Nashid, J. C. Newbold, C. S. Nicol, A. Nimalasuria, D. Norton, M. J. O'Donnell, M. G. O'Flynn, W. E. Owens, S. H. Pearse, Peggy C. Permain, Nancy Perry, R. Pettycrew, W. M. Philip, H. M. Pickard, G. Platt, N. Ponnampalam, Mary Rabinowitz, Shila G. Ransom, B. N. B. Rao, J. A. Ritchie, D. W. Rossiter, B. M. D. Rosten, A. Sah, E. Samuel, D. A. Sanford, I. C. Sarwal, J. S. H. Scott, W. P. Shemilt, G. L. Simmons, R. Sinha, A. Skolar, J. M. Smiles, F. W. Smith, E. H. J. Smyth, J. B. Spearman, W. H. Stephenson, R. S. Stevens, G. T. Stockings, W. Stoddart, R. N. Tattersall, W. J. J. Taylor, D. T. Thomas, G. F. J. Thomas, C. S. Van Heerden, R. N. E. Watt, J. C. Watts, Una M. Westell, Ailsa M. L. Whitehouse, B. D. Whitworth, D. J. Wilkes, G. Williams, R. Williamson, W. H. Wolstenholme, S. R. Wood, Eluned Woodford-Williams, P. M. Wright, H. R. Wynne, D. E. Yarrow, M. Yasin, A. L. Young, M. D. Young, Ruth E. Young, Z. E. Zuckerman.

Diplomas were granted jointly with the Royal College of Physicians as follows:

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—G. T. Balean, C. H. Bannerman, A. V. Bernard, W. T. C. Berry, A. M. El-Nakah, M. Faimuddin, H. P. Fernandes, W. Horovitz, J. F. Jarvis, Eileen M. King, C. A. McComiskey, J. L. McLetchie, M. L. Nairac, W. R. Phillipps, J. W. Pickles, S. Sen, P. C. B. Shirreffs, H. E. Shortt, B. L. Somway, T.-S. Sze, I. S. Varma, H. D. Weatherhead,

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—H. Berney, R. J. Buxton, C. J. Cantillon, C. Cockburn, E. Edwards, P. B. English, E. D. G. Galton, H. Goldschmidt, H. E. Hargreaves, A. Kamel, A. Ll. Lance, J. S. MacLean, J. A. Magnus, B. R. Medlycott, E. D. E. E. O'Brien, G. B. Orbell, W. Russell, H. H. Skeoch, J. K. S. Smith, E. J. Somerset, L. P. Spero, J. P. J. Taunk, J. H. Young, J. E. Zeitlin.

DIPLOMA IN MEDICAL RADIOLOGY.—A. K. M. Khan, K. P. Mody, J. R. Nuttall, W. Tennent, J. A. Vote, D. A. Wilson.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the Royal College of Physicians of London held on July 30th, with the President, Lord Dawson of Penn, in the chair, the following were elected officers for the ensuing year: *Censors*, Lord Horder, Sir Maurice Cassidy, C. E. Lakin, Albert Ramsbottom; *Treasurer*, Sidney P. Phillips; *Registrar*, Sir Raymond Crawfurd; *Harveian Librarian*, Arnold Chaplin; *Assistant Registrar*, C. E. Newman.

Awards and Appointments

The Weber-Parkes Medal and Prize was awarded to Sir StClair Thomson for his valuable work on tuberculosis of the larynx, carried out over a long period of years, and the Moxon Gold Medal to Dr. Edward Mellanby, F.R.S., for his distinguished work on the problems of nutrition.

The Harveian Oration will be delivered by Sir Walter Langdon-Brown on October 19th, at 4 p.m.

The President announced that he had appointed Dr. Arthur Hurst as Harveian Orator for 1937, and Dr. E. A. Cockayne as Bradshaw Lecturer, 1937.

Dr. J. W. McNee was re-elected a representative of the College on the Executive Committee of the Imperial Cancer Research Fund.

Membership

The following candidates, having satisfied the Censors' Board, were elected to the Membership of the College:

H. W. Allen, D.M., E. C. Allibone, M.B.Leeds, J. C. Batt, M.D.Bristol, J. F. Bradbury, M.B.New Zealand, Margaret B. Cleland, M.B.Adelaide, W. T. Cooke, B.Chir., P. T. Cooper, M.B. Camb., Beryl D. Corner, M.B.Lond., A. A. Cunningham, M.D. Dubl., J. V. Dacie, M.B.Lond., H. S. Davis, L.R.C.P., G. Davison, M.D.Durham, A. D'Souza, M.B.Lond., C. J. Gavey, M.B.Lond., L. E. Glynn, M.B.Lond., W. H. P. Hill, M.D.McGill, J. P. Horan, M.D.Melbourne, M. H. K. Kane, M.B.Lond., G. C. Moss, M.B.Melbourne, E. H. T. Nash, L.R.C.P., N. R. Pooler, M.B.Lond., N. L. Price, M.D.Bristol, B. K. R. R. K. Rao, M.B.Mysore, A. A. Rogow, M.D.Toronto, J. Sakula, M.B.Lond., M. A. Soliman, M.D.Cairo, D. J. Thomas, M.D.Melbourne, R. W. D. Turner, M.B.Camb., Air Commodore H. E. Whittingham, C.B.E., M.B.Glasg., R.A.F.

Licences and Diplomas

Licences to practise were conferred upon 175 candidates (including 22 women), whose names are published in the report of the meeting of the Royal College of Surgeons of England in this issue, as are the names of the recipients of the Diplomas in Tropical Medicine and Hygiene (22), Ophthalmic Medicine and Surgery (24), and Medical Radiology (6). Diplomas in Public Health (13), Psychological Medicine (17), and Laryngology and Otology (5) were granted to the successful candidates whose names were published in the report of the meeting of the Royal College of Surgeons of England in the *British Medical Journal* of July 18th (p. 154).

The following diplomas were also conferred, jointly with the Royal College of Surgeons of England:

DIPLOMA IN ANAESTHETICS.—M. N. Desai, H. C. Disher, H. Johnson, M. Selim, J. Smith, H. N. Webber, H. B. Wilson, R. A. Beaver, D. Blatchley, H. Canwarden, J. A. Carman, B. Coden, Phyllis F. L. Daplyn, C. J. M. Dawkins, M. M. Deane, Margaret L. A. Galbraith, H. Grant-Whyte, V. A. Goldman, G. G. Havers, M. W. P. Hudson, I. C. James, I. D. Jones, R. N. Jones, Agnes W. O'D. Kennedy, F. B. Mallinson, Ruth E. Mansfield, P. J. Nagle, P. M. Overton, C. B. Picken, R. A. C. Rice, A. D. Woolf, Tamsin M. Wynter.

CONJOINT BOARD IN SCOTLAND

The following candidates have been approved at the Final Professional Examination for the Scottish Triple Qualification:

B. G. Kelly, W. C. Botha, A. Sachs, I. A. Badawi, A. Loeser, S. Grubin, L. Stern, J. Charnus, E. Wittkowar, Kate Misch, B. Kirschner, J. Weinstein, N. H. Solomon, H. W. Kosterlitz, Babette Herz, B. S. Oxman, G. B. Drummond, L. H. Mirsky, A. Keay, G. M. Warrack, L. M. Shirlaw, D. McLean, C. R. Hamand, T. M. Dolan, W. A. Christie, H. Hirschson, J. W. Magill, J. Lanny, H. G. Grieve, W. L. McNamara, J. H. Kuhn.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

On July 31st, before Parliament adjourned for the Summer Recess, the Royal Assent was given to the Midwives Act, Education Act, Education (Scotland) Act, Public Health Act, Public Health (London) Act, Housing Act, Shops (Sunday Trade and Restriction) Act, Firearms (Amendment) Act, Private Legislature Procedure (Scotland) Act, North Herts Joint Hospital District Act, and to other measures.

Both Houses stand adjourned till October 29th, but provision is made for calling them earlier if the public interest requires this. The debate in the House of Commons on July 31st on the motion for the adjournment was devoted to foreign affairs. Some discussion about mental hospitals had been proposed, but time did not allow it.

Changes in the Ministry are announced to take effect on September 1st. They include: Minister of Pensions, Mr. Herwald Ramsbotham; Parliamentary Secretary to the Board of Education, Mr. Geoffrey Shakespeare; Parliamentary Secretary to the Ministry of Health, Mr. R. S. Hudson.

Registration of Hairdressers

The Hairdressers (Registration) Bill, introduced by Mr. Compton in the House of Commons and read a first time on July 29th, includes, in Clause 2, a definition that

> The expression "hairdressing" means the performance of any treatment of the hair and scalp, face, hands or arms of any person for the cleanliness, comfort, or better appearance thereof; and includes the diagnosis and treatment of any disease of the hair and scalp, face, hands or arms, providing the treatment is not of a nature requiring medical attention and does not include the performance of any operation for which an anaesthetic is required.

Clause 1 runs:

> A person registered under this Act shall be entitled to practise hairdressing in any part of Great Britain; and from and after the first day of January one thousand nine hundred and thirty-eight a person shall not be entitled to recover any charge or fee in any court for the performance of any act of hairdressing or for any hairdressing attendance or advice unless he is a registered person or is a legally qualified medical practitioner.

The Bill cannot make further progress in the present session.

Deputation on Medical Education

A deputation of the Parliamentary Medical Committee, led by Sir Francis Fremantle, was received at the House of Commons on July 29th by Mr. Ramsay MacDonald, Lord President of the Council, with whom was Professor E. Mellanby. The deputation put forward considerations relating to the development of medical education. It urged that in this the needs of the public required closer attention than was possible under the present law and that the Medical Acts were primarily devised for the protection of the public. Suggestions were advanced for altering the General Medical Council by adding lay members. It was also suggested that the medical curriculum should be amended by condensation of the teaching of preliminary subjects and by a more active education in preventive medicine and positive health. The general practitioner should have greater influence on this curriculum.

The Lord President, after referring to the limitations upon his powers in these matters, undertook to consider the points raised.

Hours of Labour

During the debate on the motion for the second reading of the Consolidated Fund (Appropriation) Bill, in the House of Commons on July 29th, several members discussed hours of labour. Mr. W. JOHN said that voluntary agreement for the reduction of hours had not been successful. The report of the Inspector of Factories showed very clearly that the conditions of employment in some industries in this country were a scandal and a disgrace to the House of Commons and to civilization. The reduction of hours would be a distinct advantage to industry and the nation. It would mean better citizens, physically and mentally. They would have improved physique, and the result would be greater efficiency.

Sir TERENCE O'CONNOR, replying to the debate, said that the conditions of employment of young people and the problem of night work were under the close consideration of the Minister of Labour. The Hours Convention at Geneva left open to other countries such different interpretations of the article which the Government was invited to ratify that no responsible Government in this country could possibly ratify it in that form. The reduction of overtime would involve sacrifices from both employers and employed. The Minister of Labour was pursuing inquiries with representatives of industry to see what could be done to secure that overtime might be reduced to, at any rate, within reasonable limits.

The Bill was read a second time.

Measles Serum Supplies

Sir KINGSLEY WOOD, in answer to Mr. Vyvyan Adams on July 30th, said his attention had been drawn to the use of convalescent serum for the prevention of infection with measles. He knew there was difficulty in obtaining adequate supplies of the serum. Attention had repeatedly been called in the annual reports of the Chief Medical Officer of his Department to the desirability of collecting and using the serum in co-operation with medical practitioners. He was not in a position to intervene further, as the matter was one primarily between medical practitioners and their patients. The wisdom of making measles a compulsorily notifiable disease had been considered in connexion with the Public Health Bill.

The gross cost of the Government Lymph Establishment in the year 1935–6 was approximately £14,000. No charge is made for vaccine lymph supplied to public vaccinators or to medical officers of health. Receipts from other sources amounted to £1,627.

Notification of Ophthalmia Neonatorum

Mr. WILFRED ROBERTS, on July 30th, asked the Minister of Health whether he knew that regulations provided that in cases of ophthalmia neonatorum notification of this disease had to be made to the district council as the local sanitary authority, whereas the county council, where it was a child-welfare and maternity authority, was responsible for treatment. In view of the fact that delay in treatment might cause blindness for life, Mr. Roberts asked the Minister to revise the regulations so as to provide that notification should be made in such cases by telegram or telephone direct to the county medical officer of health, concurrently with notice to the district council.

Sir KINGSLEY WOOD in reply said that under the regulations in force a medical practitioner in attendance upon a child suffering from this disease was required to notify the case forthwith to the medical officer of health of the local sanitary authority. That officer was required to forward a copy of such notification to the county medical officer of health within twenty-four hours of its receipt. A system of dual notification appeared to present certain disadvantages, and he saw no sufficient reason for amending the regulations in the manner suggested. The importance of making definite arrangements for securing the prompt treatment of this disease had been emphasized in circular letters issued to local authorities by the Ministry of Health.

Forthcoming Factories Bill

Sir John Simon, on July 30th, told Sir Percy Harris that the Government intended to introduce a Factories Bill in the next session. Provision for adequate and suitable lighting of factories would be included in this Bill. Complaints of glare were not frequent, but the provisions contemplated for the Bill would enable this to be dealt with. Mr. Geoffrey Lloyd, replying to further questions by Sir Percy Harris on the same date, said the proposed Factories Bill would greatly strengthen the present provisions as to safety. He added that during 1935 3,837 complaints on working conditions were received by inspectors of factories. These dealt with 5,257 subjects, and the complaint was wholly or substantially borne out on inquiry in 2,342 cases. These were followed by prosecution or other remedial action.

Prevalence of Drug Addiction.—Mr. Geoffrey Lloyd informed Mr. Stuart Russell on July 30th that a statement of there being 30,000 drug addicts in the United Kingdom purported to be based on a report of the Opium Section of the League of Nations Secretariat. The report, which had been withdrawn from circulation, included a statement showing for each of fifty-nine countries (including the United Kingdom) how many drug addicts there would be in each of these countries on the assumption that the proportion of addicts to population was the same as it was estimated to be in Germany, the United States, and Egypt. On this wholly unfounded assumption it was calculated that the figure for the United Kingdom would be 4,600, 46,000 or 92,000, according as to whether Germany, the United States, or Egypt were taken as the basis of computation. The Home Secretary did not propose any action in the matter.

"Newly Born."—The Home Secretary proposes to confer with the Lord Chancellor on the question of modifying the Infanticide Act, 12 and 13 George V, c. 18, by the insertion of a definition clause whereby it should be enacted that for the purposes of the said Act a newly born child should be deemed to be any child whose death occurred within one month of birth.

Certifying Factory Surgeons—Sir John Simon, answering Mr. Tinker on July 30th, said the Departmental Committee on Workmen's Compensation was reviewing the general question of the position and functions of certifying factory surgeons under the Workmen's Compensation Act. He would prefer to await its report before laying down any rigid rule that certifying surgeons should not hold positions or act as medical advisers to owners of works or employers whose employees came before them to be certified. Sir John added that if Mr. Tinker sent him particulars of individual cases he would go into them at once.

Pollution of the Thames.—Sir KINGSLEY WOOD stated on July 30th that he was aware of the report last summer by the medical officer of health for the Port of London to the City Corporation in which it was claimed that the pollution of the Thames estuary would, in all probability, become more serious; and that, if deficiency of rainfall continued or recurred there would be danger of the Thames becoming definitely offensive in its course through London. Sir Kingsley added that he was now giving the whole matter careful consideration. Works for the purification of a substantial part of the London sewage were in progress.

Obituary

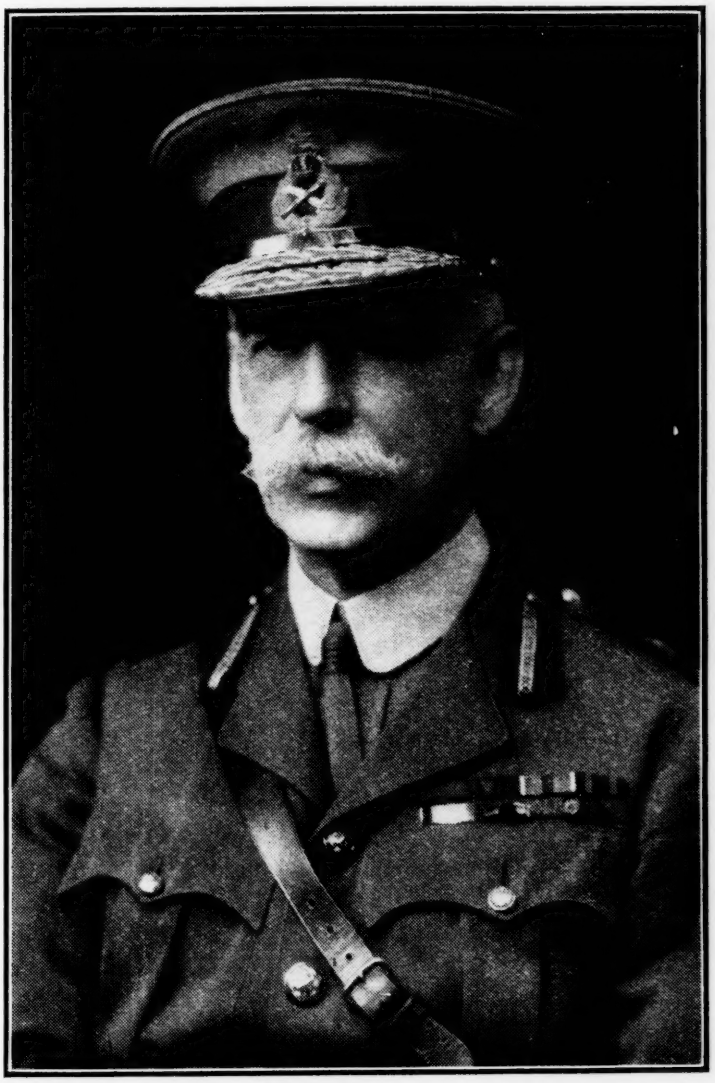
SIR ALFRED KEOGH, G.C.B., G.C.V.O., C.H.

M.D., M.Ch., LL.D., F.R.C.P., F.R.C.S.

Director-General, A.M.S., 1904–10 and 1914–18

Lieutenant-General Sir Alfred Henry Keogh, G.C.B., the great medical administrator who had twice held office as Director-General of the Army Medical Services, died in London on July 30th, aged 79.

He was born in Dublin on July 3rd, 1857, the son of Henry Keogh, resident magistrate of Roscommon, and was educated at Queen's College, Galway, and at Guy's, graduating M.D. and M.Ch. of the Royal University of Ireland in 1878. After acting as house-physician at the Brompton Chest Hospital, London, and as clinical assistant at the Royal Westminster Ophthalmic Hospital, he entered the Army as surgeon on March 6th, 1880, passing in second. At Netley he gained the Herbert Prize and the Martin Memorial gold medal. He served in South Africa as commandant of a general hospital, with the rank of colonel, and took part in operations in Cape Colony, the Orange Free State, and Transvaal, was mentioned in dispatches in the *London Gazette* of April 16th, 1901, was promoted to the selected list, and received the Queen's medal with four clasps and the C.B. On January 1st, 1902, he was appointed Deputy Director-General, and in 1904, while still a lieutenant-colonel, was selected as Director-General, being promoted to colonel on December 2nd, to surgeon general on December 3rd, and to Director-General on January 1st, 1905, retiring on March 6th, 1910.



Soon after the war of 1914-18 began it was found that the work of Director-General was too much for one man. General Sir Arthur Sloggett, Keogh's successor as Director-General, went to France to fill that post with the Expeditionary Force, while Keogh was reappointed Director-General in England, to organize and administer the medical services at home, holding that post till 1918.

He had a long list of honours: C.B. 1900, K.C.B. 1906, Honorary Physician to the King, 1907, G.C.B. 1917, Grand Officer of Legion of Honour 1917, Grand Officer of Crown of Belgium, 1917, Serbian White Eagle, first class, 1917, Companion of Honour 1918, G.C.V.O. 1918; and honorary degrees as F.R.C.S.I. 1906, F.R.C.S.Eng. 1917, F.R.C.S.Ed. 1917, D.Sc. of Oxford and Leeds, M.D. Dublin, LL.D. Edinburgh and Aberdeen. He was elected a Fellow of the Royal College of Physicians of London in 1914.

After the South African War Keogh was nominated a member, representing the R.A.M.C., of the committee appointed by the then Secretary of State for War, Mr. Brodrick, afterwards Earl Midleton, for the reorganization of the Army Medical Services, an experience which proved invaluable in the crisis of 1914. In 1908 as Director-General he personally visited the various hospitals in the kingdom to which medical schools were attached, explained to their staffs his ideas as to the establishment of great hospitals throughout the country for service in an emergency, and induced the majority of the medical officers who staffed the existing large civilian hospitals to undertake the obligation of service in time of war and to take commissions as officers *à la suite* in the Territorial R.A.M.C. When the war began many of the leaders of the profession took temporary commissions as surgeon generals and colonels, and went abroad as consulting surgeons and physicians, thus, of course, throwing more work on those who remained at home. At the same time buildings of all descriptions had to be altered for use as hospitals—schools, workhouses, and institutions of various kinds for the larger hospitals, private houses lent by their owners for the smaller ones. It was fortunate that arrangements had been made beforehand for such changes, though it was not until war was declared that the alterations necessary could actually be made. At the same time the R.A.M.C. had to be expanded, until at last it came to include a large part of the civil profession, and arrangements made for the treatment of the sick and wounded abroad. Some of these arrangements were just those which have been made in every war, though never before on such a scale as then required. Others were completely new—for instance, the casualty clearing stations, a most useful and successful innovation. First-aid treatment had to be organized at the actual front by the regimental medical officers, and arrangements were required for transfer to the casualty clearing stations, where much surgical work was done, for evacuation to the base hospitals on the coast of the Channel, for transfer by sea to England, and for distribution about the country.

Inoculation against various diseases had been tried and found useful in South Africa, but was carried out on a greatly extended scale in the great war. The ravages of

the diseases which in previous wars had been so fatal to the armies of all nations—enteric fever, tetanus, cerebro-spinal fever, etc.—though they could not be entirely prevented, were very much reduced. For the first time on record deaths from injuries caused a greater mortality in the war than those from disease. Another innovation was the concentration of injuries of a like kind, so far as possible, for treatment together by officers specially skilled in that particular line—for example, head injuries at one centre, wounds of the face at a second, fractures of the thigh at a third, and so on.

After he retired from the Service in 1910 Keogh took up the office of Rector of the Imperial College of Science and Technology at South Kensington, and retained the post until 1922, though during the war he was unable to find time to carry out the duties. He was a commissioner of the Red Cross Society during the early months of the great war, and a Knight of Grace of St. John of Jerusalem,

In April, 1919, five months after the armistice, the British Medical Association held a special Clinical and Scientific Meeting at the Imperial College of Science and Technology for the pooling of war experiences by the leaders of medical and scientific work in the Services before they returned to civilian duties in different parts of the world. Sir Alfred Keogh gave warm support to the project; he became a member of the general committee under the chairmanship of Sir Clifford Allbutt (who presided over the four-day meeting); and he contributed an introductory article on the work of the Imperial College to the volume of proceedings published afterwards by the Association. He had joined the B.M.A. in 1884, and remained a member until his retirement from public life in 1922.

Sir Alfred Keogh married twice: in 1880 Elizabeth, daughter of Surgeon Major H. G. Williams, I.M.S.—she died in 1887; and secondly, in 1888, Camilla, daughter of Captain W. Hamilton Hart, 105th Regiment. By his first wife he had a son, and by his second two daughters.

Dr. BERNARD MYERS writes:

All those who were privileged to come into close contact with the late Sir Alfred Keogh during the great war, when he occupied the post of D.G.M.S. at the War Office, will feel deeply grieved at his death, marking as it does the passing of a great gentleman, a great organizer and administrator, and a staunch friend. On several occasions during the war I asked his opinion about important matters in connexion with the medical arrangements of the New Zealand Expeditionary Force in Great Britain and abroad, and invariably his very understanding mind gave precisely the information required and always expressed with his deep knowledge and calm considered judgement. I remember one occasion when Sir George Richardson (the general officer in charge of administration to the New Zealand Expeditionary Force in the United Kingdom) and I called on him at the War Office early in 1916 to ask for a suitable hospital or building to form another New Zealand hospital on the London and South-Western Railway system, and within five minutes he arranged for us to take over the then Indian hospital at Brockenhurst to become No. 1 N.Z. General Hospital.

[The photograph reproduced is by Russell, London.]

SIR HENRY WELLCOME

Mr. KENNETH WALKER writes:

May I be allowed to add a note to the official obituary notice that appeared on August 1st of the death of a far-seeing and munificent friend of medical science? It is of the private individual rather than of the public character that I wish to speak. As one who was in attendance during his final illness I am perhaps in a position to do so, for it is during moments of suffering and when face to face with life's crises that the true nature of a man is likely to show itself. During the last two weeks of his life Sir Henry Wellcome displayed in particular three characteristics which were so integral a part of his nature that nothing, not even the final struggle to live, could obscure them: a tenacious courage, an unflagging interest in all the concerns with which he had been associated, and an unfailing good humour and gratitude to his medical attendants. Seldom has one met a patient who more appreciated the efforts of those around him to relieve his discomforts or whose attention was fixed so much on the positive side of things rather than on the negative.

It is to be hoped that the interests which he held outside his immediate business such as his museums will be carried on as a fitting memorial to a man of such breadth of vision as Sir Henry Wellcome.

One of the Edinburgh Infirmary consultant surgeons for diseases of the ear, nose, and throat passed away on July 18th in the person of JOHN MALCOLM FARQUHARSON, M.B., F.R.C.P.Ed. Born seventy-two years ago the son of Dr. Duncan Farquharson of Tillicoultry, he attended the neighbouring Dollar Academy and received his medical education at Edinburgh University, from which he graduated M.B., C.M. in 1887. Post-graduate study at Moorfields and Vienna followed a period of work as house-surgeon at Glasgow Royal Infirmary, and after several years in general practice in Edinburgh he decided to specialize in oto-laryngology. He became M.R.C.P.Ed. in 1901 and was elected a Fellow in 1903. Appointed assistant surgeon to the Royal Infirmary in the ear, nose, and throat department, Farquharson later became full surgeon, and after serving for the full period of fifteen years was on his retirement appointed consulting surgeon. He was a conscientious, painstaking, and careful worker, never sparing himself in the interests of his students, patients, and those who asked his advice in consultation. His work was almost exclusively on the clinical side, for he was not adapted by training or inclination to original investigation, although he spared himself in no way to gain knowledge of what was most recent in his specialty and kept himself abreast of the literature of his subject. He will be greatly missed by his contemporaries. J. O.

The name of Lieut.-Colonel J. S. PURDY, D.S.O., M.D.Aberd., D.P.H.Camb., who died at Sydney on July 27th, aged 64, should be well known to the Aberdeen men who graduated in the late 'nineties under the old regulations. He was of an original mind, and throughout his varied life was successful in all his undertakings. After graduation and learning the business of his profession in a colliery practice in the North of England, he migrated to New Zealand to his brother, Surgeon General J. R. Purdy. The South African War enticed him to South Africa as Surgeon Captain of the 6th New Zealand Mounted Rifles, where he served under General Plumer. At the end of this war he remained at Dundee, Natal, for several months and then returned to England, where he was resident medical officer at Dean Street, Soho, and also at St. Pancras Infirmary. Taking his M.D.Aberd. and D.P.H.Camb. over thirty years ago, he was appointed a medical officer to the Egyptian Quarantine Service. After some years he was appointed district medical officer, Auckland, N.Z., and was also in Tasmania, finally settling as a metropolitan medical officer of health at Sydney. The great war brought him back to Europe as a Surgeon Major. He was present at the Gallipoli landing and subsequently Lieut.-Colonel commanding the 10th Australian Field Ambulance, and he gained the D.S.O. in France. At the end of the war he returned to his Australian appointment. Always active, efficient, and original in his work, he was due to retire in 1937, and was looking forward to his return to England to a well-merited rest. The recent sudden death of his daughter shook him badly, and he died in harness. No particulars of his death have come through, but he leaves the memory of a brave man. J. S. W.

The following well-known foreign medical men have recently died: Dr. TELEMACO BUSINI, professor of anatomy in Buenos Aires University; Dr. JOSEPH GUÉRARD, professor of clinical medicine in the Quebec Faculty of Medicine; Professor ENRICO MORSELLI, an eminent psychiatrist of Genoa; Dr. CUELLAR DURAN, professor of clinical urology; Dr. EMILLERMO GOMEZ, professor of operative medicine at Bogota; and Professor SERGE PETROVITCH FEDOROV, a leading surgeon of Leningrad and an authority on the surgery of the bile ducts and gastro-enterology.

The Services

HONORARY SURGEONS TO THE VICEROY

Lieut.-Colonels A. MacD. Dick, C.B.E., and G. G. Jolly, C.I.E., I.M.S., have been appointed Honorary Surgeons to the Viceroy and Governor-General of India.

DEATHS IN THE SERVICES

Surgeon Commander William Nicholls Horsfall, R.N. (ret.), died in London on July 19th. He was educated at Melbourne University, where he graduated M.B., B.S. in 1902. After serving as honorary assistant physician to the North Shore Hospital, Sydney, and as honorary medical officer of Newcastle Hospital, he entered the Navy, but resigned on April 10th, 1913. He rejoined for the war, and became surgeon commander on November 11th, 1918. He had recently been living in Bermuda.

Lieut.-Colonel William Adolphus Justice, Indian Medical Service (ret.), died in London on July 27th, aged 66. He was born on May 26th, 1870, and was educated at Aberdeen, where he graduated M.B., C.M. in 1893, subsequently taking the D.P.H. at Cambridge in 1897. He went to India as a special plague officer, and served in that capacity from January 26th, 1898, to January 28th, 1902, when he was given a commission as lieutenant in the I.M.S. He became major on July 29th, 1913, and retired on February 12th, 1920. Most of his service in India was spent in civil employ in the Madras Presidency, where he held the posts successively of resident medical officer of the Madras General Hospital, lecturer on hygiene and bacteriology in the Madras Medical College, and sanitary commissioner to the Government of Madras. Plague appeared in India in 1896, and during the next five or six years a large number of doctors were sent out to India as special plague medical officers, on temporary engagements. In 1902 the Indian Government offered to give commissions in the I.M.S. to all plague officers then serving. Most of them were too old to make it worth while to accept commissions which involved entering at the bottom of the Service, even though they were allowed to count their plague service for pension, and only six officers, of whom Justice was one, joined the I.M.S. These were the only officers who entered the I.M.S. otherwise than by competitive examination between the abolition of the East India Company in 1858 and December, 1914.

Medical News

The second International Medical Week in Switzerland will be held at Lucerne from August 31st to September 5th. The detailed programme can be obtained from the offices of the *Journal Suisse de Médecine*, Klosterberg 27, Basle.

The first Congress of the Austrian Radiological Society will be held at Vienna from September 4th to 8th, and will be followed by the sixth Congress of the International Association of Urology, which will continue until September 12th. Various excursions and entertainments are being arranged in connexion with these two congresses, and specially reduced charges are available for visitors on Austrian Federal railways. The office address for both congresses is Karlsplatz 5, Vienna.

The second Congress of German Neurologists and Psychiatrists will be held at Frankfort from August 22nd to the 25th. Further information can be obtained from Nervenklinik, Heinrich-Hoffmann Strasse, 10, Frankfort a.M.

A German institution for post-graduate study, the Berlin "Akademie für ärztliche Fortbildung," is organizing a series of courses for the autumn. They will be open to doctors from abroad, for whom a reduction of 60 per cent. on the railway fares can be obtained. The course on diseases of the throat, nose, and ears, to be held between September 28th and October 10th, will cost RM. 150. The second course, on children's diseases, will last from October 19th to 24th, and cost RM. 50. The third course, on malignant disease, will last from October 19th to 26th and cost RM. 60. The fourth course, on disturbances of nutrition, vitamins, and hormones, will last from October 26th to 31st and cost RM. 50. The fifth course, on tuberculosis, will last from November 2nd to 7th and cost RM. 50. The sixth course, on intrathoracic surgery, with special reference to pulmonary tuberculosis, will be held at a time to be fixed later. The seventh course, on homoeopathy, will last from October 12th to November 6th. The eighth course, on various aspects of clinical and laboratory medicine, will be held in October and November, and cost from RM. 50 to 80. The first seven courses will be held in German, but some of the lectures in the eighth course will be delivered in a foreign language. For further information apply to Berliner Akademie für ärztliche Fortbildung, Berlin, N.W.7, Robert-Koch-Platz 7 (Kaiserin Friedrich-Haus).

The late Sir Henry Wellcome in his will has appointed Mr. Geo. E. Pearson governing director for life of the Wellcome Foundation Ltd. Mr. Pearson has been deputy governing director of the Foundation since its formation in 1924.

The German Society for the Study of Accidents will hold its annual meeting at Hamburg, under the presidency of Professor Zur Verth, on September 17th and 18th, when the two principal subjects for discussion will be (1) inheritance and constitution in relation to insurance; (2) damage to the menisci.

At a ceremony held on June 28th at Rheims, a centre for aero-medical studies was inaugurated under the auspices of many public and private authorities. Dr. Crochet, the leader of this centre, is engaged on a study of the effects of various altitudes on various diseases. His "aerodrome sanitaire" was started about two years ago.

At a recent meeting of the International Society of the History of Medicine it was decided that the eleventh congress should be held in September, 1938, at Athens, Stamboul, Sofia, and Zagreb.

At the suggestion of the President of the Rumanian Medical Society a union of Balkan doctors has been formed for the promotion of friendly relations between practitioners in the different Balkan States.

On July 29th representatives of the Socialist Medical Association appeared before the Voluntary Hospitals Commission and submitted certain recommendations. It is gratifying to find that the views of this body on the question of the payment of consulting staffs of voluntary hospitals are in accordance with the policy of the British Medical Association, one of the recommendations being that "it is essential for the improved efficiency of treatment and in the interests of the medical profession that the consulting staffs of voluntary hospitals should be paid an annual salary on a part-time basis." A second important submission is that an effort should be made to regulate the number of attendances per session at out-patient departments, and to permit general practitioners to make appointments for patients referred by them.

Delegates to the First Empire Dental Meeting, held by the British Dental Association, were received by Sir Cuthbert and Lady Wallace at the Royal College of Surgeons of England on July 28th. Groups of Hunterian specimens and specimens from the odontological collection were on view, and an exhibition of books and drawings from the library. Dancing and a demonstration of cinema films added to the attractions of an enjoyable evening.

Sir Ernest Graham-Little, M.P., has been elected a member, *honoris causa*, of the French Dermatological Society.

The second part of the July issue of the *American Journal of Syphilis, Gonorrhoea and Venereal Diseases* is devoted to a report of the New York City Commission appointed to investigate the prevention and control of syphilis and gonorrhoea in Scandinavian countries and in Great Britain.

Those interested in the subject may like to know that a journal—*Speech*—is being published quarterly as the journal of the British Society of Speech Therapists.

Science Progress for July, 1936, contains an article by Professor E. D. Adrian on "Research on the Central Nervous System," and one by Dr. Joseph Needham on "Biochemistry and Causal Morphology in Amphibian Regeneration."

The Epidemiological Report of the Health Section of the League of Nations for April to June is devoted to the international lists of causes of death and the extent of their adoption in various countries.

Professor Ernst Finger, the well-known dermatologist and syphilologist of Vienna, celebrated his 80th birthday on July 8th.

Dr. W. K. Blackie has been appointed President of the Rhodesian Branch of the British Red Cross Society.

The number of cases of diphtheria in Holland among a total population of 8,000,000 has fallen from 7,450 in 1930 with 439 deaths to 2,990 with 143 deaths in 1934, and the percentage fatality from 5.9 in 1930 to 4.8 in 1934.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin).

QUERIES AND ANSWERS

Income Tax

Retirement from Partnership

"F. R." says A. and B. have been in partnership on a half-share basis. The partnership accounts have been made up on a cash basis to September 30th each year. A. is disposing of his half-share as from October 1st, 1936, but retaining his half-share in the firm's book debts. "What is A.'s share of the firm's income tax up to the time of his retirement?"

*** A. will have to account for tax on one-half of the amount, which would have represented his share of the firm's gross assessment for the financial year ending April 5th, 1937. The gross amount of the firm's assessment for that year is, of course, calculated on the firm's profits for the year to September 30th, 1935, and A.'s liability will be on one-quarter of that amount less personal allowances. He will not be liable to account for tax on his share of the book debts as they are received.

Car Transactions

"X. Y. Z." replaced a car in 1932–3 and claimed cost of replacement, and as it affected the assessment for 1933–4, did not claim depreciation allowance on the new car (which cost £225) for that year. He replaced that car in 1935–6 and for the financial year 1936–7 will be allowed "obsolescence £57, and wear and tear on the present car £57." Is this correct?

*** Yes. The rule that "replacement" and depreciation allowances must not operate to affect the same year does not apply to "obsolescence" and depreciation. There is, however, one point for attention. On the figures quoted it would seem that the depreciation applicable to 1933–4—that is, £50—which was not received, has been deducted in arriving at the obsolescence allowance. This is not correct, and that allowance should be increased by £50.

LETTERS, NOTES, ETC.

Treatment of Angina Pectoris

Dr. W. A. Chapple (London, W.2) writes: I have suffered from angina for a number of years and have been able to alleviate the pain promptly with 1/100 grain of trinitrin. Recently, however, I have been able to obtain the same result much more promptly by taking a maximum inspiration; at the end of the expiration following this the pain is gone. The pulse rate has been 110 before the inspiration, with frequent extrasystoles, and at the end of the expiration it has been 74, and the extrasystoles have gone; the relief has been complete, and the pain has not recurred, perhaps for a day or more, when the same treatment gives a like result. The inhalation of oxygen might be equally beneficial in severer cases, and, if so, simple small containers could be made available in the homes of sufferers. This treatment is physiologically rational.

Infection and Invigoration

Dr. D. A. Alexander (Bristol) writes: Many of us have fugitive impressions that positive good results from disease. We recover; we are as we were before; we are better. We grew apace after measles; relations grew stout after enteric; friends became robust after tuberculosis. The state of pregnancy, with its miseries and mishaps, has another side that brings to many women a vigour they had not known before; the fertilizing particle, potent for harm, is also powerful for good. It would be of interest to collate and analyse any cases lying in one's clinical memory in relation to this theme. Disease takes away and it gives—seasickness illustrates the former; one has experienced such mental clarity after a voyage that it were worth while encountering rough seas to have that clarity again. The tranquillity, the joy of convalescence, from tonsillitis, for example, or influenza may have a physical counterpart in the humoral reaction to an invader. The high hope of the phthisical suggests that there is in the tubercle bacilli something akin to champagne; a something which emerges as such after its human implantation. Are there grounds for encouraging the sick that their illnesses are destined to increase their strength and prolong their days? Analogies are at hand; in the body politic the threat of invasion calls out a volunteer force, to the permanent strength of the nation; races are made by fusion; metals, the most precious, are hardened by alloy. While we set ourselves against the infecting agents as unmitigated evils to be kept outside is it possible that exception is now and then to be made; a reconciliation may have been effected; man and microbe may be symbiotic.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 34, 35, 36, 37, 38, 39, 42, and 43 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 40 and 41.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 116.